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Environmental Impact Report

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Environmental Impact Statement

for the proposed

Mesquite Mine Expansion

Imperial County, California
SCH. No. 98121054 / BLM No. 40204

Prepared by the



County of Imperial
Planning & Building Department

and

Bureau of Land Management
California Desert District

August 2000

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Draft
Environmental Impact Report / Environmental Impact Statement (EIR/EIS)

for the Proposed

Mesquite Mine Expansion

State Clearinghouse No. 98121054

BLM No. CA-40204

Applicant:
Newmont Gold Company
1700 Lincoln Street
Denver, Colorado 80203

Prepared By:

U.S. Department of the Interior
Bureau of Land Management

Tim Salt
District Manager
California Desert District

County of Imperial
Planning and Building Department

Jurg Heuberger
Planning Director
County of Imperial

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Tim Salt
District Manager
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County of Imperial
Planning and Building Department

Jurg Heuberger
Planning Director
County of Imperial

August 29, 2000

Dear Reader:

We are pleased to provide the Draft Environmental Impact Report and Environmental Impact Statement (EIR/EIS) for the proposed Mesquite Mine expansion project for your review and comment. The proposed project would be located on public lands, state lands and private lands in eastern Imperial County, approximately 5 miles east of Glamis, north and west of SR-78. The proposed expansion comprises enlargement of several pits, waste rock piles, and heap leach pads, encompassing nearly 700 acres, of which 190 acres require new permits. The purpose of this document is to provide information to the public, as well as the cooperating and responsible agencies regarding the environmental consequences of expanding the existing open-pit, heap-leach, precious metal mine. Various technical reports have been prepared which have been used in the preparation of this Draft EIR/EIS and some are attached as appendices. Copies of all of the referenced technical reports are available for review at the Imperial County Planning/Building Department and the Bureau of Land Management (BLM) office in El Centro, California. The Draft EIR/EIS can be reviewed at the listed local libraries in the attachment.

To facilitate review, this document has been prepared as an Environmental Impact Report (EIR) in compliance with the California Environmental Quality Act (CEQA) and implementing regulations and guidelines. The County of Imperial is the Lead Agency for the purpose of compliance with the requirements of CEQA for the proposed Mesquite Mine expansion.

This document has also been prepared as an Environmental Impact Statement (EIS) in compliance with the National Environmental Policy Act (NEPA) and implementing regulations. The Bureau of Land Management is the Lead Agency for the purpose of compliance with the regulations of NEPA for this proposed expansion.

Comments concerning the adequacy of this Draft EIR/EIS will be considered in the preparation of the Final EIR/EIS. The Final EIR/EIS will be used in the determination of approval or denial of the various discretionary actions by BLM and the County. A Record of Decision (ROD) will be prepared by the BLM but not until after BLM has received the Biological Opinion from the U.S. Fish & Wildlife Service. The County will review the Conditional Use Permit and Reclamation Plan for the proposed mine expansion.

A combined federal and state public review period of 60 days has been established for this draft document. Due to a change in the printing date, please disregard the August 8, 2000, date within the document. Written comments on the environmental document will be accepted by BLM and the County until 5:00 p.m. on October 30, 2000, and should be sent to the addresses listed below.

Bureau of Land Management	Imperial County Planning/Building Dept.
1661 South 4th Street	939 Main Street, Suite B-1
El Centro, CA 92243	El Centro, California 92243

For internet users, you may also review the document on the Internet at www.ca.blm.gov/elcentro/mesquite/. In addition, a public hearing will be held after the public comment period to receive verbal and written testimony on January 10, 2001 by the County Planning Commission in El Centro, California.

For information concerning the non-federal aspects of the EIR, including comments on the draft EIR, contact Jurg Heuberger, AICP, CEP, Planning Director at (760) 482-4236, extension 4310; for information concerning the federal aspects of the project, including comments on the draft EIS, contact Kevin Marty, BLM at the El Centro field office at (760) 337-4422.

Tim Salt
BLM District Manager
California Desert District

Jurg Heuberger, AICP, CEP
Planning Director
Imperial County Planning/Bldg. Dept

JH/DG/RC/BLM/sm/Deireis

29 Augosto, 2000

Estimado Lector:

Nos da gusto de proporcionar los siguientes documentos; Reporte Ensayo de Impacto Ambiental y Ensayo de Declaración de Impacto Ambiental (Draft EIR/EIS), para proporcionar el proyecto de la expansión Mesquite Mine para que usted pueda examinar y comentar. El proyecto propuesto sera colocado en tierras públicas, tierras de estado, y tierras privadas al este del Condado de Imperial, aproximado 5 millas al este de Glamis, norte y oeste de SR-78. La expansión propuesta abarca ampliación de varios bancos de materiales, desperdicio de piedra, y drenaje de campo (heap leach pads) abarcando cerca de 700 acres, de los cuales 190 acres requieren nuevos permisos. El propósito de éste documento es para proporcionar información al público, como tambien a las agencias cooperativas y responsables en cuanto a las consecuencias ambientales de la expansión de bancos de materiales, drenaje de campo (heap leach pads), y mina de metal precioso. Varios reportes técnicos se han preparado, de los cuales se han utilizado en la preparación de éste Ensayo EIR/EIS, y algunos se han sujetado como apéndices. Copias de todos los reportes técnicos son disponibles para examinar en la lista de bibliotecas incluida, y tambien disponibles en el Departamento Planeación y Construcción de el Condado de Imperial y la Agencia de Administración de Tierras (BLM), en El Centro, California.

Para facilitar examinación de éste documento se a preparado un Reporte de Impacto Ambiental (EIR) en sumisión con el Acto Ambiental de Calidad de California (CEQA) y regulaciónes implementarias. El Condado de Imperial es la Agencia encargada para el propósito de sumisión con los requisitos de el Acto Ambiental de Calidad de California (CEQA) para la expansión propuesta Mina Mesquite.

Éste documento tambien a sido preparado como Declaración de Impacto Ambiental (EIS) en sumisión con el Acto Ambiental de la Póliza Nacional (NEPA) y regulaciónes implementarias. Agencia de Administración de Tierras (BLM) es la Agencia encargada para el propósito de sumisión con la regulaciónes de NEPA para el próposito de sumisión con las regulaciónes de NEPA para la expansión propuesta.

Comentarios referente a éste documento Reporte Ensayo de Impacto Ambiental y Ensayo de Declaración de Impacto Ambiental (Draft EIR/EIS) seran considerados en la preparación del Final EIR/EIS. El Final EIR/EIS sera usado en la diterminación de aprobación ó negación de varias acciónes discriminatorias por BLM y el Condado. Una decisión grabada (ROD) sera preparada por la Agencia de Administración de Tierras (BLM) pero no hasta despues que BLM alla recibido la Opinión Biológica de el Departamento de Pesca y Vida Salvaje de los Estados Unidos. El Condado revisara el Permiso de Uso Condicional y Plan de Reclamación para la expansión de la propuesta de mina.

Se a establesido una examinación pública por un periodo de 60 dias, combinada de federal y estado para éste documento. Debido a un cambio en la fecha de impreta, favor de pasar por alto la fecha 8 de Agosto, 2000, dentro el documento. Comentarios por escrito sobre el documento ambiental seran acceptados por BLM y el Condado hasta las 5:00 p.m., 30 de Octubre, 2000, y tienen que ser enviados a los siguientes domicilios.

Bureau of Land Management	Imperial County Planning/Building Dept.
1661 South 4th Street	939 Main Street, Suite B-1
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Tambien se puede examinar el documento por Internet a www.ca.blm.gov/elcentro/mesquite/. Adicionalmente, habra reuniónes públicas despues de el periodo de comentarios públicos para recibir testimonios verbales en 10 de Enero, 2001, Comisión Planificación del Condado en El Centro, California.

Para información referente a los aspectos no-federales del EIR, incluso comentarios de el Reporte Ensayo de Impacto Ambiental (Draft EIR), porfavor de contactar a Jurg Heuberger, AICP, CEP, Director de Planeación y Construcción al (760) 482-4236, extensión 4310; Para información referente a los aspectos federales de el proyecto, incluyendo comentarios del Ensayo de Declaración de Impacto Ambiental (Draft EIS), porfavor de contactar a Kevin Marty, BLM de El Centro, California al (760) 337-4422.

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Mesquite Mine Expansion Project, Imperial County, California

Federal Mine Plan of Operations Approval, Imperial County Conditional Use Permits and Reclamation Plan Approval

Draft Environmental Impact Report / Environmental Impact Statement

Lead Agencies:

U.S. Department of the Interior
Bureau of Land Management
California Desert District
El Centro Resource Area

County of Imperial
El Centro, California

Prepared By:

BRG Consulting, Inc.

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El Centro, CA 92243
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Jurg Heuberger, Director
Imperial County Planning and Building Department
939 Main Street
El Centro, CA 92243
(760) 339-4236

Written Comments Due: Oct. 27, 2000

Abstract:

Newmont Gold Company (Newmont) proposes to expand mining and processing of ore and waste rock (overburden/interburden, O/I) in and near their existing Mesquite Mine. The Mine site is located at the southern end of the Chocolate Mountains, approximately 33 miles east of the City of Brawley, in eastern Imperial County.

The existing Mine site encompasses 5,200 acres, of which 3,655 acres have been disturbed by mining activities to date. Prior permits issued by BLM and the County of Imperial allow mining or related disturbance on 4,962 acres. Proposed new facilities include expansions of existing mine pits, diversion channels to keep surface waters from flowing into the pits, heap leach pad areas for removal of the gold from the ore, and overburden/interburden storage areas (OISAs) for storage of waste rock. Total acreage of these areas in the Proposed Action is 693 acres, of which only 190 acres represents new disturbance areas for which new permits will be required. The remaining 503 acres are areas that were previously permitted, or were previously disturbed by ancillary mining activities. Approximately 89 million tons of gold ore would be processed, and 242 million tons of overburden/interburden would

be moved. Approval of this expansion would allow the Mine to continue to operate through 2006, instead of closing in 2001.

Approximately 20% of the Proposed Action expansion areas are located on private land. Another 13% are within California State lands north of the existing Mine site. The remaining 67% of the proposed expansion area is within BLM-managed lands.

Cumulative impacts to visual resources are anticipated, in conjunction with the planned and approved but unbuilt Mesquite Landfill adjacent to the Mine. Cumulative PM_{10} (fugitive dust) air quality impacts are anticipated because of the area's nonattainment status for that pollutant. No other unmitigated direct, indirect, or cumulative impacts of the Proposed Action have been identified.

Alternatives to the Proposed Action have been identified in accordance with CEQA and NEPA guidelines. One other feasible alternative (Reduced Footprint Alternative) was addressed in this EIR/EIS. Other possible alternatives were identified, but were found to be infeasible and were eliminated from further consideration.

The Reduced Footprint Alternative would forego development of the proposed Big Chief West OISA, and would reduce the sizes of the East Rainbow North OISA and the East Rainbow South OISA by a total of 45 acres. This alternative would reduce the area of new land to be disturbed by storing approximately 90 million tons of waste rock (of the projected 240 million tons to be generated in proposed excavations) in the existing mine pits.

Under the No Project/No Action alternative, expansion of the proposed facilities would not occur, but mining and processing of ore would continue for a short time. Mining would continue in the Vista and Big Chief pits, overburden / interburden would be placed to their permitted limits on the existing OISAs, and leaching of gold from the ore would continue at the permitted heap leach pads.

Benefits associated with the Project are primarily social and economic in nature. If the expansion is approved, it is anticipated that the Mine will remain open an additional six years. This will provide continued employment for the existing work force, as well as an additional 20-30 new employees. This will increase local income levels and local governmental revenues. In addition, trust funds managed by the State Lands Commission will receive additional mineral extraction royalties.

Numerous other governmental actions, decisions and approvals will have to occur before expansion of the Mine can proceed. These actions include:

- Endangered Species Act, Section 7 Consultation between BLM and U.S. Fish & Wildlife Service
- U.S. Fish & Wildlife Service to review the Biological Evaluation, and issue Biological Opinion
- National Historic Preservation Act, Section 106 Consultation between the BLM and the California Office of Historic Preservation (completed)
- BLM to approve Mine Plan of Operations
- U.S. Army Corps of Engineers to approve an individual permit to dredge or fill Waters of the United States
- BLM to publish a Record of Decision on this EIS
- California Dept. of Game and Fish to review the Biological Evaluation, issue a CESA Incidental Take Permit, and a Streambed Alteration Agreement (Section 1603)
- California Regional Water Quality Control Board to decide whether to amend Waste Discharge Requirements for discharge of waste to land; also to approve a Certificate of Compliance with Section 401 of the Clean Water Act
- California State Lands Commission to review/ approve a Mineral Extraction lease
- Imperial County Board of Supervisors to certify this EIR, and approve a Mitigation Monitoring and Reporting Program; also approve a Conditional Use Permit amendment/Reclamation Plan for Mine expansion, approve a Conditional Use Permit amendment for continued use of water from the Mesquite Mine well field.

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Mesquite Mine Expansion EIR/EIS
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EXECUTIVE SUMMARY

Purpose of This Document

This draft Environmental Impact Report/ Environmental Impact Statement (EIR/EIS) addresses the potential impacts and mitigation measures for construction and operation of the proposed Mesquite Mine Expansion. This document is being prepared as an EIR in compliance with the California Environmental Quality Act (Public Resources Code, Section 21000, et seq., herein, "CEQA"), the Guidelines for the Implementation of CEQA (CCR Section 15000, et seq., herein "State CEQA Guidelines"), and the Imperial County CEQA Guidelines, as amended. The County of Imperial is the lead agency for the purpose of compliance with the requirements of CEQA for the Proposed Action.

This document is also being prepared as an EIS in compliance with the National Environmental Policy Act (Public Law 91-90, 42 U.S.C. 4321 et seq., herein "NEPA") and the implementing Council on Environmental Quality (CEQ) Regulations (CFR Sec. 1500-1508). The Bureau of Land Management (BLM) National Environmental Policy Handbook (H-1790-1) was also consulted in preparing this document. The BLM is the lead agency for the purpose of compliance with the requirements of NEPA for the Proposed Action.

This EIR/EIS examines the potential environmental impacts of excavating additional pits to obtain and process known gold ore in or adjacent to the existing Mine site.

Proposed Action

Newmont Gold Company (Newmont) proposes to expand mining and processing of ore and waste rock (overburden/interburden, O/I) in and near their existing Mesquite Mine. The Mine site is located at the southern end of the Chocolate Mountains, approximately 33 miles east of the City of Brawley, in eastern Imperial County. The general location of the Mine site is shown in Figure S-1.

The existing Mine site encompasses 5,200 acres, of which 3,655 acres have been disturbed by mining activities to date. Prior permits issued by BLM and the County of Imperial allow mining or related disturbance on 4,962 acres. Proposed new facilities include expansions of existing mine pits, diversion channels to keep surface waters from flowing into the pits, heap leach pad areas for removal of the gold from the ore, and overburden/interburden storage areas (OISAs) for storage of waste rock. Total acreage of these areas in the Proposed Action is 693 acres, of which only 190 acres represents new disturbance areas for which new permits will be required. The remaining 503 acres are areas that were previously permitted, or were previously disturbed by ancillary mining activities. New areas that would be disturbed by mining activity under the Proposed Action are shown in Figure S-2. Approximately 89 million tons of gold ore would be processed, and 242 million tons of overburden/interburden would be moved. Approval of this expansion would allow the Mine to continue to operate through 2006, instead of closing in 2001.

Approximately 20% of the Proposed Action expansion areas are located within private land. Another 13% are within California State lands north of the existing Mine site. The remaining 67% of the proposed expansion area is within BLM-managed lands.

Alternatives

Alternatives to the Proposed Action have been identified in accordance with CEQA and NEPA guidelines. One other feasible alternative (Reduced Footprint Alternative) was addressed in this EIR/EIS. Other possible alternatives were identified, but were found to be infeasible and were eliminated from further consideration.

Reduced Footprint Alternative

An alternative that would disturb approximately 47 acres less of unpermitted, undisturbed land than the Proposed Action was also evaluated. This Alternative is designated the "Reduced Footprint" Alternative. It would forego development of the proposed Big Chief West OISA, and would reduce the sizes of the East Rainbow North OISA and the East Rainbow South OISA by a total of 45 acres. This alternative would reduce the area of new land to

be disturbed by storing approximately 90 million tons of waste rock (of the projected 240 million tons to be generated in proposed excavations) in the existing mine pits.

No Project / No Action Alternative

Under this alternative, expansion of the proposed facilities would not occur, but mining and processing of ore would continue for a short time. Mining would continue in the Vista and Big Chief pits, overburden / interburden would be placed to their permitted limits on the existing OISAs, and leaching of gold from the ore would continue at the permitted heap leach pads.

Impacts That Cannot Be Mitigated

Cumulative impacts to visual resources are anticipated in conjunction with the planned and approved but unbuilt Mesquite Landfill adjacent to the Mine. Cumulative PM_{10} (fugitive dust) air quality impacts are anticipated because of the area's nonattainment status for that pollutant. No other unmitigated direct, indirect, or cumulative impact of the Proposed Action has been identified.

Summary of Project Impacts

The environmental consequences of the Proposed Action and its alternatives are evaluated in Chapter 4 of this EIR/EIS for each of the 12 elements of the human environment identified through the scoping process. No significant impacts to the following critical elements of the human environment would occur for any of the project alternatives.

- Air Quality (mitigated)
- Areas of Critical Environmental Concern
- Cultural Resources
- Farm Lands
- Floodplains
- Native American Religious Concerns
- Threatened or Endangered Species (mitigated)
- Hazardous or Solid Wastes
- Water Quality
- Wetlands/Riparian Zones
- Wild and Scenic Rivers
- Wilderness

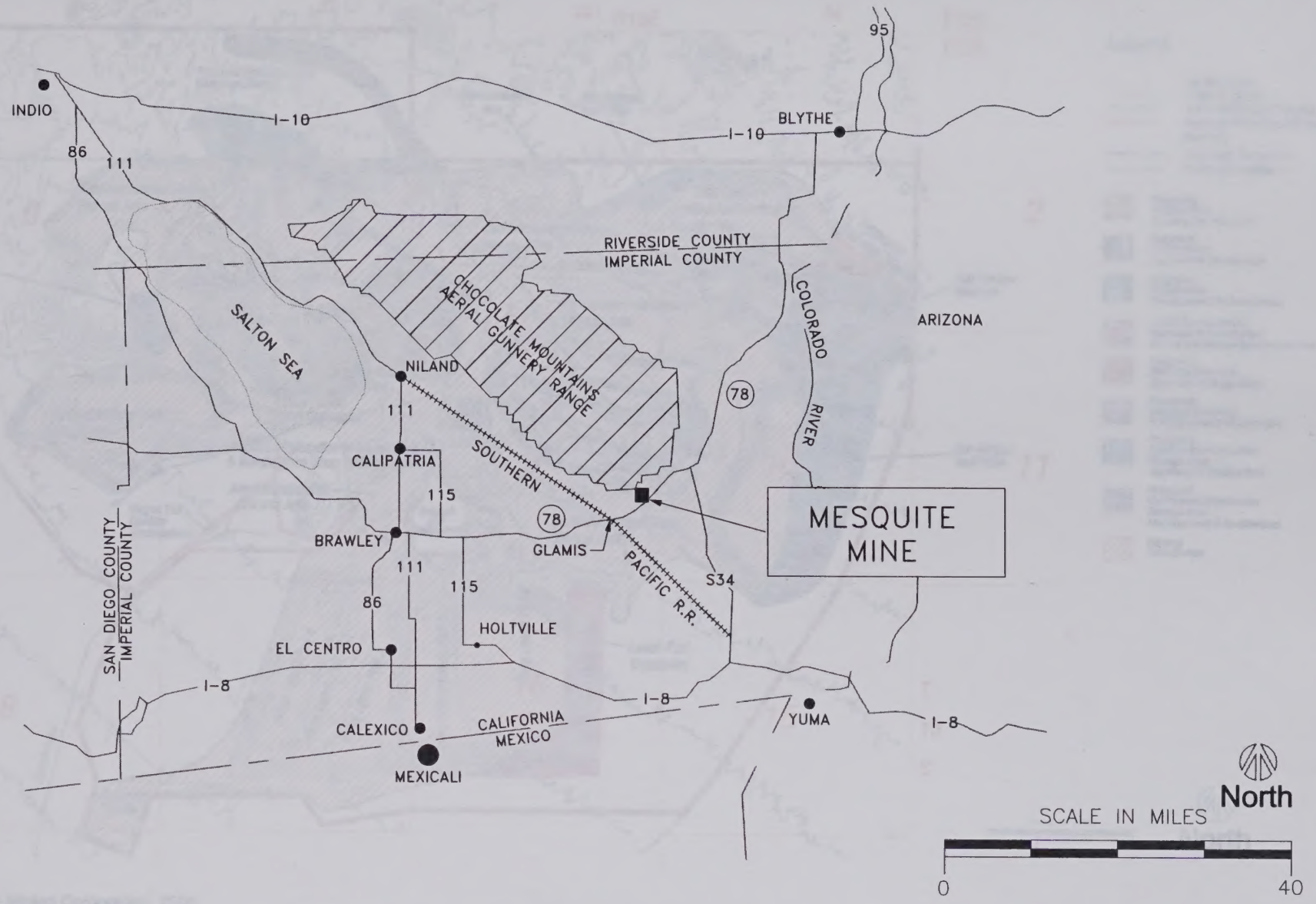
Chapter 4 includes a discussion of mitigation measures that would eliminate impacts or would reduce them to a level less than significant.

Table S-1 summarizes the environmental effects of the Proposed Action and its alternatives. The table addresses the potential impacts that are expected to occur, their significance, recommended mitigation measures, and resulting level of significance after implementation of the mitigation measures.

Other Federal, State, and Local Actions

Numerous other governmental actions, decisions and approvals will have to occur before expansion of the Mine can proceed. These actions include:

- Endangered Species Act, Sec.7 Consultation between BLM and U.S. Fish & Wildlife Service
- U.S. Fish & Wildlife Service to review the Biological Evaluation, and issue Biological Opinion
- National Historic Preservation Act, Section 106 Consultation between the BLM and the California Office of Historic Preservation (completed)
- BLM to approve Mine Plan of Operations
- U.S. Army Corps of Engineers to approve an individual permit to dredge or fill waters of the United States
- BLM to publish a Record of Decision on the EIS
- California Dept. of Game and Fish to review the Biological Evaluation, issue a CESA Incidental Take Permit, and a Streambed Alteration Agreement (Section 1603)
- California Regional Water Quality Control Board to decide whether to amend Waste Discharge Requirements for discharge of waste to land; also to approve a Certificate of Compliance with Section 401 of the Clean Water Act
- California State Lands Commission to review/ approve a Mineral Extraction lease
- Imperial County Board of Supervisors to certify this EIR, and approve a Mitigation Monitoring and Reporting Program; also approve a Conditional Use Permit amendment/Reclamation Plan for Mine expansion, approve a Conditional Use Permit amendment for continued use of water from the Mesquite Mine well field.
- Modification to existing Authority to Construct and Permit to Operate from the Imperial County Air Pollution Control District



SOURCE: Newmont Mining Corporation, 1999

7/7/00

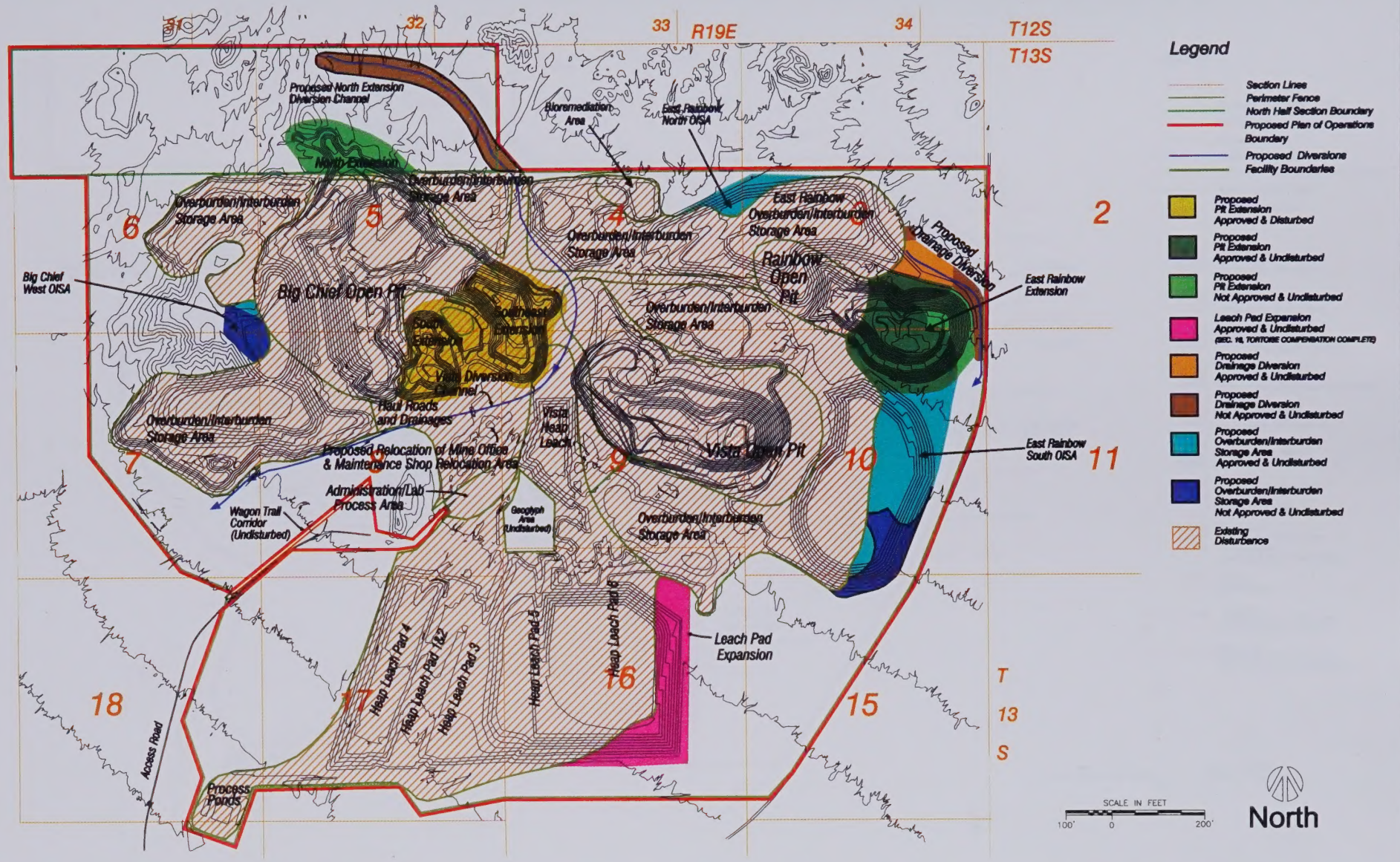
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Mesquite Mine Expansion EIR/EIS

Regional Location Map

FIGURE

S-1



SOURCE: Newmont Mining Corporation, 2000

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S-5

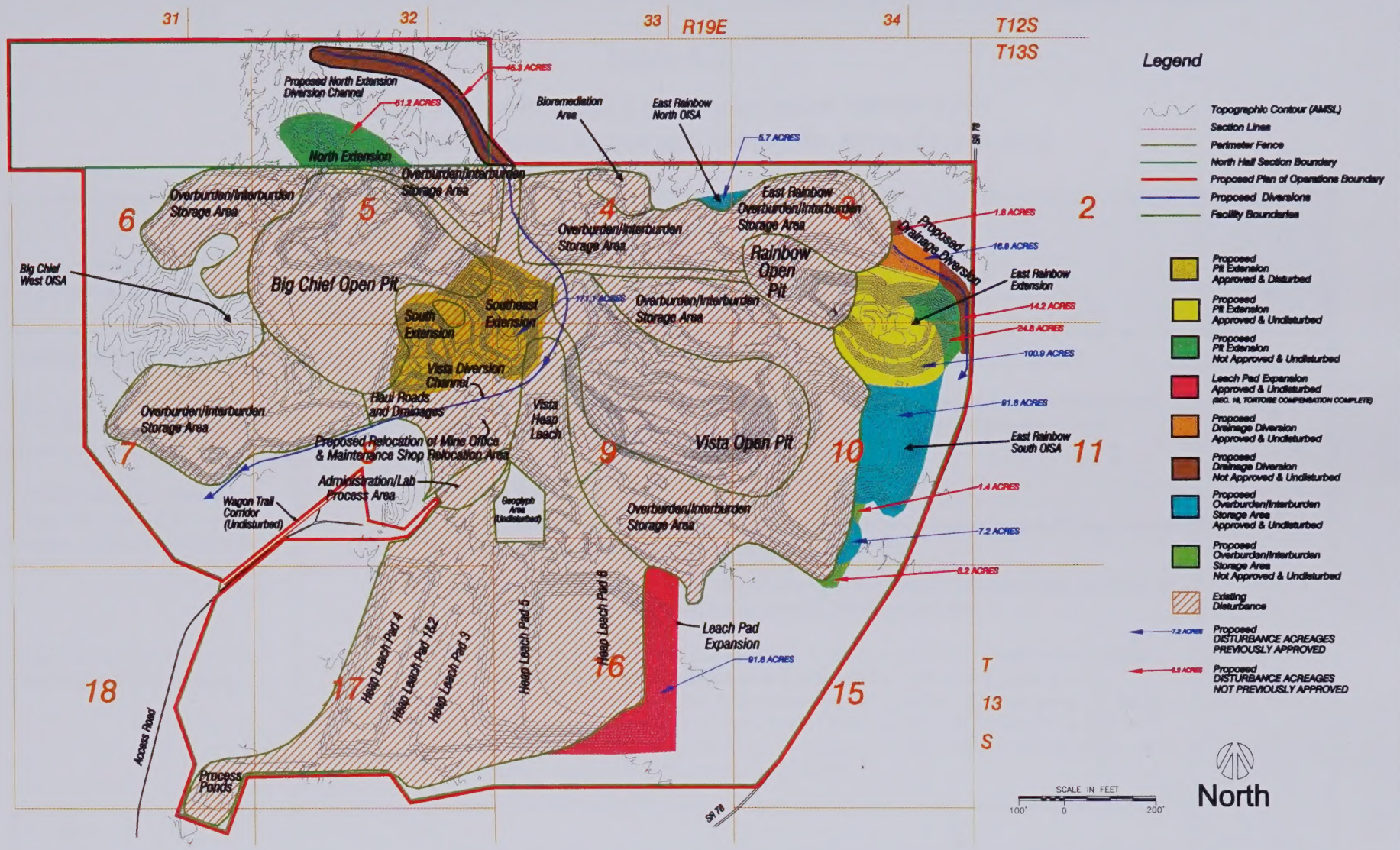
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Mesquite Mine Expansion EIR/EIS

Proposed Action

FIGURE

S-2



SOURCE: Newmont Mining Corporation, 1999

7/7/00

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Mesquite Mine Expansion EIR/EIS

Reduced Footprint Alternative

FIGURE

S-3

Table S-1

Summary of Potential Environmental Effects and Mitigation Measures, Proposed Mesquite Mine Expansion

Impact, by Environmental Topic	Level of Signifi-cance Without Mitigation	Mitigation Measures	Level of Signifi-cance With Mitigation
Geology, Soils and Mineral Resources			
Proposed Action Possible erosion on OISA and leach pad slopes.	S	Best Management Practices (BMP's) for control of erosion would be implemented, as part of the Stormwater Pollution Prevention Plan required by General Stormwater Permit.	NS
Possible erosion in new Diversion Channels and in existing desert washes downstream from them.	S	Same as above. Also… Applicant to ensure that peak flow conditions in off-site washes are substantially the same as what would have occurred without the presence of the Mine. Applicant shall incorporate stable channel configurations and/or protection such as riprap to limit erosion of diversion ditches not associated with the expansion.	NS
Potential damage to Mine facilities from earthquakes.	S	Applicant shall design pit wall configurations in conformance with SMARA requirements. Pit slope parameters will be determined and reviewed by California-registered civil engineers, with appropriate safety factors based on their professional experience. Pit design information will be submitted for review to the California Dept. of Conservation, Office of Mine Reclamation. Final decisions about pit design parameters will be made by the County of Imperial, delegated this authority under SMARA. Benches shall be provided in pit walls at regular intervals to catch minor sliding/raveling. Applicant and their engineers will consider to ensure pit slope stability include 1) unloading the top of the slope; 2) providing buttresses for steep slopes; 3) backfilling waste rock at the base of excavated slopes.	NS

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Table S-1 (continued)

Summary of Potential Environmental Effects and Mitigation Measures, Proposed Mesquite Mine Expansion

Impact, by Environmental Topic	Level of Signifi-cance Without Mitigation	Mitigation Measures	Level of Signifi-cance With Mitigation
Geology, Soils and Mineral Resources (continued)			
Reduced Footprint Alternative Impacts similar to those of the Proposed Action.	S	Same as identified for the Proposed Action.	NS
No Project/ No Action Altern. Possible erosion mpacts similar to those of the Proposed Action	S	Best Management Practices (BMPs) for control of erosion are being implemented as part of the existing Stormwater Pollution Prevention Plan for the NPDES permit	NS
Water Resources			
Proposed Action It is possible that significant erosion and resulting sedimen-tation could occur in the diversion channels and downstream.	S	The Applicant shall incorporate the following water protection features into the proposed construction, operation and closure of the expansion, as required by CCR Title 27 mining regulations administered by the Colorado River RWQCB. • Design and construct diversion and drainage facilities to accommodate precipitation conditions associated with the 100-year precipitation event. • Ensure that peak flow conditions in off-site washes are substantially the same as what would have occurred without the presence of the Mine. • Design and construct the East Rainbow and Vista diversion channels to discharge flows at approximately the same locations and flow rates that occur presently or which historically occurred prior to development of the Mine diversion system. • Repair abnormal erosion and take steps to prevent further occurrence in a timely manner	NS

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Table S-1 (continued)

Summary of Potential Environmental Effects and Mitigation Measures, Proposed Mesquite Mine Expansion

Impact, by Environmental Topic	Level of Signifi-cance Without Mitigation	Mitigation Measures	Level of Signifi-cance With Mitigation
Water Resources (continued)			
Proposed Action (continued) Fluids utilized in the heap leach process could potentially escape and pollute ground water.	S	• The heap leach pad expansion shall be constructed with a low permeability liner system to contain process fluids. • The heap leach pad expansion shall be operated with monitoring systems to allow detection of potential process fluid leakage in the subsurface. • The leach pad expansion shall be closed in a manner such that, after closure, it no longer poses a threat to water quality.	NS
Proposed Action may impact up to 25 acres of Waters of the U.S., under Army Corps of Engineers (ACOE) jurisdiction. Actual number of acres affected will be determined by ACOE.	S	• Applicant shall mitigate impacts to Waters of the U.S. as determined by the ACOE within the concurrent Section 404 process. It is anticipated that such mitigation will involve preservation of an appropriate acreage of Waters within the proposed compensation area for desert tortoise habitat.	NS
Fuels and other bulk liquids used on site could potentially spill and result in pollution of surface or ground waters.	S	1. Applicant will store fuels and other bulk liquids with the potential to contaminate ground water in aboveground containers within containment areas. • Containment structures shall be designed by a Registered Civil Engineer, and construction shall be supervised and certified by a Registered Civil Engineer or a Certified Engineering Geologist.	NS

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Table S-1 (continued)

Summary of Potential Environmental Effects and Mitigation Measures, Proposed Mesquite Mine Expansion

Impact, by Environmental Topic	Level of Significance Without Mitigation	Mitigation Measures	Level of Significance With Mitigation
Water Resources (continued)			
Proposed Action (continued) Erosion from new OISAs could potentially result in downstream sedimentation.	S	• Applicant shall construct and operate the proposed expansion facilities in accordance with the California General Permit for Stormwater (NPDES). These requirements include implementing a Stormwater Pollution Prevention Program incorporating BMPs. • The OISAs shall be closed in a manner that will minimize erosion and the threat of water quality degradation from sedimentation.	NS
Evapoconcentration of minerals and elements in the pit lake waters could potentially pollute groundwater resources. However, the analysis shows that the pits will act as "sinks", pulling in water from adjacent strata, and evaporating it. The waters will not flow the other way.	NS	None required.	NS
Reduced Footprint Alternative Impacts similar to those of the Proposed Action.	S	Same as identified for the Proposed Action, except that fewer acres of Waters of the U.S. would need to be preserved under this alternative.	NS

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Table S-1 (continued)

Summary of Potential Environmental Effects and Mitigation Measures, Proposed Mesquite Mine Expansion

Impact, by Environmental Topic	Level of Signifi-cance Without Mitigation	Mitigation Measures	Level of Signifi-cance With Mitigation
Water Resources (continued)			
No Project/No Action Alternative Impacts would be similar to those of the Proposed Action, except that no additional waters of the U.S. would be affected, and there would be no expansion of OISAs or heap leach pads beyond the levels and locations already allowed by permit. In addition, the facility after closure would not require the 1,500 acre-feet per year of water that would be needed for the Proposed Action.	S	Best Management Practices (BMPs) for control of erosion are being implemented as part of the existing Stormwater Pollution Prevention Plan for the NPDES permit. In addition, measures to preclude water pollution from the heap leach pads and OISAs are already in place, as a result of prior operating permits.	NS
Biological Resources			
Proposed Action **Vegetative Habitat** The proposed expansion would result in a direct loss of approximately 380 acres of	S	1. At the end of the project, disturbed areas, including new access roads, should be re-contoured and re-seeded with an appropriate mixture of native plant species according to the Reclamation Plan. All desert tortoise-proof fences should be removed also according to the Reclamation Plan.	NS

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Table S-1 (continued)

Summary of Potential Environmental Effects and Mitigation Measures, Proposed Mesquite Mine Expansion

Impact, by Environmental Topic	Level of Significance Without Mitigation	Mitigation Measures	Level of Significance With Mitigation
Biological Resources (continued)			
Proposed Action (continued) creosote/ desert pavement habitat, approximately 67 acres of microphyll woodland habitat, and approximately 45 acres of upland succulent habitat. Another 15 acres of microphyll woodland would be cut off from upstream water sources south of the proposed North Diversion Channel. Blue palo verde (*Cercidium floridum*) and desert ironwood (*Olneya tesota*), associated with these 3 plant communities would also be impacted. Suitable habitat for ribbed cryptantha and winged cryptantha was observed throughout the Proposed Action area, though	S	2. Access should be confined to approved routes to reduce impacts brought about by road proliferation. 3. All bladed vegetation and excavated materials should be stockpiled in such a manner that they do not obstruct the natural flow of water down wash systems. 4. Avoid destruction of vegetation, particularly cacti and patches of herbaceous plants, whenever possible. 5. Scarify all compacted soil (except desert pavement) upon completion of mining activities. This may be done by using rippers, discs, rakes or other appropriate equipment. 6. Storage of equipment, supply material, ores or any residue of the mining operation shall be accomplished in a manner that minimizes surface disturbance. 7. Approximately 1,440 acres of similar but higher-quality habitat would be preserved as part of compensation for the loss of desert tortoise habitat.	NS

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Table S-1 (continued)

Summary of Potential Environmental Effects and Mitigation Measures, Proposed Mesquite Mine Expansion

Impact, by Environmental Topic	Level of Signifi-cance Without Mitigation	Mitigation Measures	Level of Signifi-cance With Mitigation
Biological Resources (continued)			
Proposed Action (continued) no individuals for these species were observed. Of these three habitat communities, micro-phyll woodland is considered the most sensitive because it provides potential habitat for several sensitive bird, reptile and mammal species. Of the approximately 82 acres of proposed impact to microphyll woodland, approximately 23 acres (heap leach pad expansion, Sec-tion 16) are already per-mitted and compensated for in accordance with previous environmental mitigation. Therefore, the Proposed Action will result in a net impact of approximately 59 acres of microphyll woodland (44 acres direct impact, 15 acres indirect).			

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Table S-1 (continued)

Summary of Potential Environmental Effects and Mitigation Measures, Proposed Mesquite Mine Expansion

Impact, by Environmental Topic	Level of Significance Without Mitigation	Mitigation Measures	Level of Significance With Mitigation
Biological Resources (continued)			
Proposed Action (continued) **CDFG Jurisdictional Streambed** Microphyll woodland and desert washes are considered to be indicators of CDFG jurisdictional streambeds. Approximately 25.24 acres of such streambeds are found within the unpermitted areas of the Proposed Action, while an additional 39.87 acres are found in areas previously permitted for Mine expansion.	S	**CDFG Jurisdictional Streambed** Impacts to CDFG jurisdictional streambed shall be mitigated at a 3:1 ratio, in accordance with permits issued by CDFG under Sections 1600 *et seq* of the Fish and Game Code. It is anticipated that mitigation will involve preservation of an appropriate acreage of CDFG jurisdictional lands within the proposed 1,440 acres of compensation lands for desert tortoise habitat.	NS

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Table S-1 (continued)

Summary of Potential Environmental Effects and Mitigation Measures, Proposed Mesquite Mine Expansion

Impact, by Environmental Topic	Level of Signifi-cance Without Mitigation	Mitigation Measures	Level of Signifi-cance With Mitigation
Biological Resources (continued)			
Proposed Action (continued) **Endangered Species** **Desert Tortoise** Approximately 693 acres of desert tortoise habitat (BLM Category II and III) will be disturbed as a result of the proposed expansion. The loss of this 693 acres of potential habitat from the proposed mine expansion would represent a significant direct impact on the desert tortoise. However, approximately 272 acres are currently compensated for under past Plans of Operation, or were disturbed prior to the listing of the desert tortoise. All of the acres in Section 16 are perm-itted and have been compensa-ted for under Biological Opin-ion (1-6-92-F-22). Therefore, no additional impacts are anticipated due to development of Sec. 16 lands.	S	The following reasonable and prudent measures are proposed as necessary and appropriate to minimize the impacts of incidental take of desert tortoise: 1. On-site biological supervision/ monitoring, along with clearance surveys and relocation efforts, shall be utilized to reduce the likelihood of harm/harassment to the desert tortoise. 2. Employee education programs, designated work areas, defined operational procedures, reclamation efforts, and a microphyll woodlands assessment shall minimize the impact of mine-related operations on both the desert tortoise and the species' associated habitat. To be exempt from the prohibitions of Section 9 of the Act, compliance must meet with the following terms and conditions. These implement the reasonable and prudent measures described above and outline required reporting/monitoring requirements. These terms and conditions are non-discretionary. 1. Compensation for loss of habitat is necessary according to BLM requirements. Current requirements are based on a formula presented in Recommendations for Management of the Desert Tortoise in the California Desert (BLM, 1988), Instruction Memorandum CDD93-13, Instruction Memorandum CDD95-14, and Compensation for the Desert Tortoise, Desert Tortoise Management Oversight Group, 1999. The project proponent shall choose one of the following: 1) Acquire compensation lands. They will be located in the Chuckwalla Bench Area of Critical Environmental Concern (ACEC). The deed for these lands is to be delivered to the BLM. Or the project proponent shall 2) provide adequate funds (the amount to be determined by the BLM) to the BLM for the acquisi-tion of compensation lands. These lands will be located in the Chuckwalla Bench	NS

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Table S-1 (continued)

Summary of Potential Environmental Effects and Mitigation Measures, Proposed Mesquite Mine Expansion

Impact, by Environmental Topic	Level of Signifi-cance Without Mitigation	Mitigation Measures	Level of Signifi-cance With Mitigation
Biological Resources (continued)			
Proposed Action (continued) **Desert Tortoise (continued)** A total of 421.6 acres of impacts to tortoise have not been compensated, and would be new impacts associated with implementation of the Proposed Action.		ACEC. The last choice is for the project proponent to 3) make permanent improvements to desert tortoise habitat. This must be upon agreement with the Fish and Wildlife Service (the Service), CDFG and BLM. For the Proposed Action the compensation ratio in Category III habitat is 1:1 (130 acres in Category III habitat; 130 acres to be compensated); in Category II habitat the ratio is 4.5:1 (291 acres in Category II habitat; 1,310 to be compensated) for a total of 1,440 acres to be compensated. For the reduced footprint Alternative the compensation ratio in Category III habitat is 1:1(109 acres in Category III habitat; 109 acres to be compensated); in Category II habitat the ratio is 4.5:1 (246 acres in Category II habitat; 1,107 to be compensated) for a total of 1,216 acres to be compensated. The mine operator must work closely with the BLM in selecting the lands most benefiting the conservation and recovery efforts. Compensation requirements shall be agreed upon prior to permitting. 2. The Mine operator shall designate a field contact representative (FCR) who will be responsible for overseeing com-pliance with protective measures for the desert tortoise, involved in compliance coordination with the BLM, and authorized to halt any mine-related actions that may be in violation of the biological opinion. The FCR (a contract biologist, company environmental coordinator, project manager, or other appropriate mine employee) shall retain a copy of the tortoise stipulations and be available on-site for all project activities. 3. Only the authorized biologist and other persons confirmed by the Fish and Wildlife Service, under the auspices of the current biological opinion, shall be permitted to handle/relocate desert tortoises. The Service and BLM must approve the wildlife biologist who must demonstrate experience in the proper handling of desert tortoises	

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Table S-1 (continued)

Summary of Potential Environmental Effects and Mitigation Measures, Proposed Mesquite Mine Expansion

Impact, by Environmental Topic	Level of Significance Without Mitigation	Mitigation Measures	Level of Significance With Mitigation
Biological Resources (continued)			
Proposed Action (continued) **Desert Tortoise (continued)**		and locating tortoises and their sign. The BLM shall submit the names and credentials of individuals to the Service for review and approval at least 15 days prior to the onset of any mine-related operations. No excavation/ surface disturbing activities will commence until the authorized biologist has been selected. A biological monitor or the authorized biologist shall be present during all surveying efforts (excluding archaeological work), any power line construction, overbuilding activities, pipeline installation, water well excavation, or road realignments. The qualified biologist must have education/ training/ experience in conducting surveys, monitoring/supervising project operations, and implementing tortoise avoidance and minimization measures. 4. The biological monitor/ authorized biologist shall regularly inspect (a minimum of three times per day) any test holes or associated open trenches, if any. Entrapped tortoises/wildlife will be permitted to move from harm's way or carefully removed from the excavation site by the authorized biologist. A final inspection of trenches and holes shall be conducted by the biological monitor/ authorized biologist just prior to backfilling. All test holes shall be immediately capped/sealed upon completion of drilling. 5. Desert tortoises may only be handled by the authorized biologist or FCR in the case of an emergency, and only when necessary. Any desert tortoise relocated or otherwise removed from areas with mine-related construction/ excavation shall be handled in accordance with the procedures described in *Guidelines for Handling Desert Tortoises During Construction Projects* (DTC 1994, revised 1999). All tortoises shall be translocated to an identified tortoise relocation site.	

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Table S-1 (continued)

Summary of Potential Environmental Effects and Mitigation Measures, Proposed Mesquite Mine Expansion

Impact, by Environmental Topic	Level of Signifi-cance Without Mitigation	Mitigation Measures	Level of Signifi-cance With Mitigation
Biological Resources (continued)			
Proposed Action (continued) **Desert Tortoise (continued)**		6. BLM, in consultation with the appro-priate regulatory agencies and the pro-ponent, will identify several areas for the relocation of tortoises within the vicinity of the Mesquite Mine. These relocation areas will be at least 0.5-1.0 mile apart in suitable microphyll wood-land habitat and a reasonable distance from paved roads and extensively used dirt roads. In order to reduce potential competition, no more than two tortoises should be relocated in each area. 7. The authorized biologist shall maintain a complete record of every desert tortoise en-countered and moved from harm's way during all mine-related efforts. At a minimum, the information shall include: location (written description and map) of the tortoise finding, date and time of observation, and details of the relocation site; tortoise life history information (i.e., weight, length, width, height, and sex); general condition and health, including any apparent injuries/state of healing and occurrence of bladder voiding upon handling; and diagnostic markings (e.g., identification number or previously marked lateral scute). 8. Desert tortoises removed/relocated from the mine site or ancillary areas shall be marked for future identification. An identification number (using the acrylic paint/epoxy tech-nique) will be affixed to the fourth costal scute (Service 1990b), and a 35 mm photo-graph (slide) of the carapace, plastron, and fourth left costal scute shall be ob-tained. No notching or replacement of fluids by injection (i.e., syringe) shall be authorized. Any water basins, bowls, or other containers provided to a tortoise for re-hydration shall be promptly removed from the field following determination by the authorized biologist that adequate fluid replacement has occurred.	

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Table S-1 (continued)

Summary of Potential Environmental Effects and Mitigation Measures, Proposed Mesquite Mine Expansion

Impact, by Environmental Topic	Level of Signifi-cance Without Mitigation	Mitigation Measures	Level of Signifi-cance With Mitigation
Biological Resources (continued)			
Proposed Action (continued) **Desert Tortoise (continued)**		9. Upon locating a dead or injured desert tortoise, BLM will be notified within 24 hours. The BLM must then notify the appropriate field office of the Service by telephone within three days of the finding. Written notification to BLM and USFWS must be within 15 days of the finding. The information provided must include the date and time of the finding or the incident (if known); location of the carcass; a photograph; cause of death, if known; and other pertinent information. Desert tortoise remains shall be collected, frozen as soon as possible, and delivered to the BLM. Injured animals shall be transported to a qualified veterinarian for treatment at the expense of the project proponent. If an injured animal re-covers, the Service should be contacted for final disposition of the animal. 10. The authorized biologist shall a summary report to the Service and BLM upon completion of the clearance surveys, relocation/ handling efforts, and any injuries/ deaths encountered during mine-related activities. Additionally, the report will include an evaluation of the effectiveness of the avoidance/ minimization measures and possible recommendations to further reduce the direct/indirect effects of the mining operations on desert tortoise and its associated habitat. 11. A raven monitoring program shall be conducted over the project's lifetime to determine whether mining actions pro-mote an increase in the relative abun-dance of ravens, and, correspondingly, a higher predation rate on desert tortoise. Five monitoring stations will be established within and around the proposed site (i.e., the center and each corner) and visited on a monthly basis. The program shall commence at least 1-year prior to any project-related surface disturbance. During a standard observation period (15 min.), the biological monitor, authorized biologist, FCR, or other Service and BLM approved individual shall record raven numbers and behavior and inspect any nest sites	

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Table S-1 (continued)

Summary of Potential Environmental Effects and Mitigation Measures, Proposed Mesquite Mine Expansion

Impact, by Environmental Topic	Level of Signifi-cance Without Mitigation	Mitigation Measures	Level of Signifi-cance With Mitigation
Biological Resources (continued)			
Proposed Action (continued) **Desert Tortoise (continued)**		for desert tortoise remains, along with documenting all carcasses found (i.e., number, size, relative time of death, and distance from nest). A report will be submitted to the Service and BLM before July 1st of each year, summarizing the monitoring results. A comprehensive raven management program shall be developed and instituted in the event that significant increases in raven numbers are observed over time. 12. A desert tortoise education program shall be presented to all mine employ-ees conducting activities at the project site, process area, or ancillary facilities. Personnel participation in the program shall precede any initiation of project actions. Following the onset of mining, new employees must formally complete the training prior to working on-site. The BLM-approved tortoise program will contain, at a minimum, the following topics: (1) desert tortoise distribution/ occurrence; (2) general behavior and ecology; (3) species' sensitivity to human activities; (4) legal protection; (5) penalties for violation of State or Federal laws; (6) reporting requirements. 13. A specially designed tortoise proof fence shall be constructed around proposed disturb-ance areas. The fence will consist of a non-breachable barrier and support structures. Galvanized hardware cloth of 0.635 cm (0.25 in) diameter shall be attached along the base of the fence and buried a mini-mum of 30 cm (12 in) underground with an above-ground extension of at least 46 cm (18 in). If burial is not feasible, the bottom one-half of the fence shall be positioned flat on the ground, opposite the project/ process area, and appropriately weighted (e.g., large rocks) or secured. Overall, the smaller 0.635 cm (0.25 in) mesh size was selected to prevent tortoise entry into the mine site and minimize the likelihood of incidental reptile mortality. Fence-ensnared lizards could attract ravens and potentially /artificially increase predation upon the resident tortoises.	

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Table S-1 (continued)

Summary of Potential Environmental Effects and Mitigation Measures, Proposed Mesquite Mine Expansion

Impact, by Environmental Topic	Level of Signifi-cance Without Mitigation	Mitigation Measures	Level of Signifi-cance With Mitigation
Biological Resources (continued)			
Proposed Action (continued) **Desert Tortoise (continued)**		14. After fence installation, the authorized biologist shall conduct a thorough survey for desert tortoises within the site. All desert tortoises found shall be removed. If the removal is during the season of above ground activity, the desert tortoises shall be placed beside a burrow of appropriate size. If the re-moval is not in the season of above ground activity, the tortoise shall be moved (dug out of burrow if necessary) on a seas-onably warm day and placed at the mouth of a burrow of appropriate size. If the desert tortoise does not en-ter the burrow, an artificial burrow may be needed. The authorized biologist shall be allowed some judgement and discretion to ensure that survival of the desert tortoise is likely. All tortoises shall be relocated to identified areas. 15. No later than 90 days after completion of fence construction, the FCR and the author-ized biologist shall prepare a report for the BLM. The report shall document the effec-tiveness and practicality of the mitigation measures. Additionally, it shall include the number of desert tortoises excavated from burrows, the number of desert tortoises moved from the site, the relocation site(s), the number of desert tortoises killed or injured, and the specific information for each desert tortoise listed above. The report shall make recommendations for modifying the stipulations to enhance desert tortoise protection or to make it more workable for the operator. 16. The fence shall be regularly monitored nd corrective action promptly taken to maintain the overall integrity of the tortoise barrier. Following storms, the fence's structure shall be assessed and immediately repaired at all damaged locations. 17. In washes and other areas susceptible to flash flooding, "break-away" tortoise fabric may be installed. These segments shall be loosely tied to the fence on higher ground, permitting the fabric to "break-away" in the event of substantial surface flows.	

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Table S-1 (continued)

Summary of Potential Environmental Effects and Mitigation Measures, Proposed Mesquite Mine Expansion

Impact, by Environmental Topic	Level of Signifi-cance Without Mitigation	Mitigation Measures	Level of Signifi-cance With Mitigation
Biological Resources (continued)			
Proposed Action (continued) **Desert Tortoise (continued)**		18. Small mesh nets, a solid high density polyethylene/polypropylene cover, or other appropriate screening shall be placed over the leach pad's adjoining ponds (i.e., pregnant and barren solu-tion ponds) to prevent tortoise access and possible injury/mortality. The coverings will be regularly inspected and maintained by the Applicant for the duration of the project. 19. During the development of all ancillary facilities/features (i.e., power lines, pipeline, water wells, or road realignments) all vehicles and equip-ment shall be limited to established roads, designated/marked spur roads, trails, and approved rights-of-way. To the maximum extent practicable, material stockpiling, equipment storage, and vehicle parking shall occur in areas of prior disturbance or generate not greater than 0.4 ha (1 acre) of new surface impacts. Additionally, to minimize surface disturbance to the surrounding habitat, the boundaries of the work area shall be conspicuously staked, flag,ged or marked. For all project-related actions, the crushing/removal of perennial vegetation shall be avoided to the maximum extent practicable. 20. Any project-related vehicle or equip-ment operating on the mine's ancillary/non-haul roads shall not exceed a speed limit of 25 mph. The project proponent will be responsible for enforcing this speed require-ment on its employees, contractors, and agents. Additionally, cross-country or off-road travel will not be permitted at any time, except under life threatening/ emergency situations. 21. Employees shall inspect beneath parked vehicles and equipment prior to traveling. If a desert tortoise is encountered, no action shall be taken until either the animal has safely and voluntarily moved away from the parked vehicle or the authorized biologist has relocated the tortoise out of harm's way.	

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Table S-1 (continued)

Summary of Potential Environmental Effects and Mitigation Measures, Proposed Mesquite Mine Expansion

Impact, by Environmental Topic	Level of Signifi-cance Without Mitigation	Mitigation Measures	Level of Signifi-cance With Mitigation
Biological Resources (continued)			
Proposed Action (continued) **Desert Tortoise (continued)**		22. If it is necessary for a worker to park temporarily outside of a cleared enclosure, the worker shall inspect for desert tortoises under the vehicle prior to moving it. If a desert tortoise is present, the worker shall carefully move the vehicle only when necessary or shall wait for the desert tortoise to move out from under the vehicle. 23. Desert tortoise notification and speed limit signs shall be posted and maintained within the project's boundaries. Employee parking areas will have con-spicuous signs alerting personnel to the presence of tortoises. Speed limits shall be posted within the mine site and along all regularly traveled ancillary/non-haul roads. 24. The BLM, in consultation with the Service, shall preapprove the type(s) of chemical dust suppres-sant(s) used on haul/maintenance /access roads prior to their application. 25. All trash and food items shall be promptly stored in raven and coyote proof containers and regularly conveyed from the mine site. Project structures/ design will minimize the potential for raven nest or perch sites and no mining features (e.g., other buildings, power/ water line enhancements, etc.) beyond the scope of the currently proposed action shall be approved or authorized. 26. Structures that may function as raven nesting or perching sites are not authorized except as specifically stated in the plan of operation notice. The project proponent shall describe anticipated structures to the BLM during initial project review. 27. No pets shall be permitted at the project site, process area or ancillary facilities, at any time. Furthermore, firearms will be strictly prohibited, except for security personnel.	

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Table S-1 (continued)

Summary of Potential Environmental Effects and Mitigation Measures, Proposed Mesquite Mine Expansion

Impact, by Environmental Topic	Level of Significance Without Mitigation	Mitigation Measures	Level of Significance With Mitigation
Biological Resources (continued)			
Proposed Action (continued) **Desert Tortoise (continued)**		28. Road kill found along the mine's primary access way shall be promptly removed/buried to reduce the attraction of ravens and other potential tortoise predators to the area. In addition, no feeding of coyotes, kit foxes, or ravens shall be allowed. 29. Upon completion of the Mesquite Mine Project, all mine-related materials and vehicles/equipment shall be promptly removed from the site. Machinery and personnel involved with the mine's subsequent reclamation shall only be permitted in the project area during the course of revegetation efforts. Once reclamation measures have been implemented, no associated equipment and supplies will be allowed torelocated the tortoise out of harm's way.	
Bat Species Suitable roosting habitat was not present within any of the proposed expansion areas, however all of the areas are considered to be suitable as foraging habitat. Three known/ potential roosting sites were identified in the region.	NS	Reclamation of microphyll woodland done concurrently with mine development may reduce impacts, if any, to California leaf-nosed bat, Greater Western Mastiff bat, small-footed Myotis, Desert pallid bat, spotted bat, and Townsend's Big-eared bat.	NS

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Table S-1 (continued)

Summary of Potential Environmental Effects and Mitigation Measures, Proposed Mesquite Mine Expansion

Impact, by Environmental Topic	Level of Significance Without Mitigation	Mitigation Measures	Level of Significance With Mitigation
Biological Resources (continued)			
Proposed Action (continued) **Western Chuckwalla** Approximately 25 acres of habitat for the western chuckwalla were observed within proposed expansion areas. No individuals were observed, but based on past observations of chuckwalla in the vicinity, it is possible that a population exists within the Proposed Action area. A loss of chuckwalla habitat may occur.	NS	**Western Chuckwalla** 1. Avoid chuckwalla habitat whenever possible. 2. Ensure that chuckwalla habitat that is avoided will have a corridor of an undisturbed lands connecting to habitat offsite. These avoidance and connection areas will be identified on a map prior to permitting.	NS
Mule Deer Approximately 82 acres (67 acres directly, 15 acres indirectly) of Microphyll Woodland will be disturbed as a result of the proposed expansion. A loss of mule deer habitat may occur including movement corridors, forage and cover.	NS	**Mule Deer** 1. A mule deer fence, whose design is approved by the game branch of CDFG, should be installed along the entire perimeter of the mine property. Fences will be routinely checked for breaks. 2. Attractive water will be fenced, contained, or otherwise made unavailable to mule deer. These deterrents will be routinely checked to assure mule deer cannot access these water sources. Death of a mule deer on the mine will be reported to CDFG within one week of occurrence.	NS

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Table S-1 (continued)

Summary of Potential Environmental Effects and Mitigation Measures, Proposed Mesquite Mine Expansion

Impact, by Environmental Topic	Level of Significance Without Mitigation	Mitigation Measures	Level of Significance With Mitigation
Biological Resources (continued)			
Proposed Action (continued) **Ecological Risk Assessment** There is a potential that the pit lake water could harm the health of animals attracted to it. The study found that salinity will limit the use of the water for drinking. However, some chemicals of concern (boron, silver, fluoride, selenium) would concentrate in any plants that would grow adjacent to the lakes, and thus be available for transfer through the dietary pathway of the food chain.	S	**Ecological Risk Assessment** Impacts from the dietary pathway will be minimized through design and construction of the pit walls. By making the pit walls as steep as practicable at the levels above and below the projected steady state pit lake water level, vegetative growth adjacent to the lakes will be minimized, thus minimizing harm to birds and animals through ingestion of harmful compounds. This will also minimize habitat creation near the lakes.	NS
Reduced Footprint Alternative Impacts to biological resources from this Alternative would be similar, but slightly less, than those of the Proposed Action. For example, this Alternative	S	The same as the Proposed Action, except that compensation for destruction of desert tortoise habitat would require transfer of approximately 1,211 acres, 167 acres less than for the Proposed Action. Also the area of microphyll woodland and Waters of the U.S. affected are estimated to be slightly less for this Alternative, 58 acres and 22 acres, respectively. The actual acreage of Waters of the U.S. will be determined by the ACOE, in the Section 404 process.	NS

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Table S-1 (continued)

Summary of Potential Environmental Effects and Mitigation Measures, Proposed Mesquite Mine Expansion

Impact, by Environmental Topic	Level of Signifi-cance Without Mitigation	Mitigation Measures	Level of Signifi-cance With Mitigation
Biological Resources (continued)			
Reduced Footprint Alternative (continued) would require compensation for im-pacts to 355.4 acres of desert tortoise habitat, a decrease of approximately 66 acres from the Proposed Action. It would also impact 1 acre less of microphyll woodland, and may impact 3 fewer acres of Waters of the U.S. All other impacts of this Alternative are very similar to those of the Proposed Action.			
No Project/ No Action Alternative This Alternative would avoid the direct loss of up to 380 acres of creosote/desert pavement habitat, 67 acres of microphyll woodland habitat, and 45 acres of upland hab-itat. It would avoid direct impacts to desert tortoise and fairy duster species, and the loss of habitat to several other species. In addition, it would avoid impacts to any areas under ACOE or CDFG jurisdiction.	NS	None required.	NS

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Table S-1 (continued)

Summary of Potential Environmental Effects and Mitigation Measures, Proposed Mesquite Mine Expansion

Impact, by Environmental Topic	Level of Signifi-cance Without Mitigation	Mitigation Measures	Level of Signifi-cance With Mitigation
Cultural Resources			
Proposed Action No cultural resources were identified that met requirements for eligibility to the National Register of Historic Places	NS	None required.	NS
Reduced Footprint Alternative Same as Proposed Action.	NS	None required.	NS
No Project/ No Action Altern. No additional area would be disturbed outside areas that are currently permitted.	NS	None required.	NS
Paleontological Resources			
Proposed Action No paleontological resources exist at the site.	NS	None required.	NS
Reduced Footprint Alternative Same as Proposed Action.	NS	None required.	NS

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Table S-1 (continued)

Summary of Potential Environmental Effects and Mitigation Measures, Proposed Mesquite Mine Expansion

Impact, by Environmental Topic	Level of Significance Without Mitigation	Mitigation Measures	Level of Significance With Mitigation
Paleontological Resources (continued)			
No Project/ No Action Altern. No additional area would be disturbed outside areas that are currently permitted.	NS	None required.	NS
Transportation			
Proposed Action No more than 20 or 30 additional employees would be required for the expansion. This would cause a negligible increase in traffic on SR 78.	NS	None required.	NS
Reduced Footprint Alternative Same as Proposed Action.	NS	None required.	NS
No Project/ No Action Alternative The mine would be closed and the 164 existing employees would be laid off. This would decrease traffic on SR 78.	B	None required.	B

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Table S-1 (continued)

Summary of Potential Environmental Effects and Mitigation Measures, Proposed Mesquite Mine Expansion

Impact, by Environmental Topic	Level of Signifi-cance Without Mitigation	Mitigation Measures	Level of Signifi-cance With Mitigation
Noise			
Proposed Action Mine employees and visitors could possibly be affected by onsite noise levels.	NS	Mine operation must comply with federal and state laws governing worker safety, including prevention of noise impacts to employees and visitors. These safety procedures are in effect now, and would continue with any Mine expansion.	NS
Visitors to the interpretive trail could hear noise from mine operations.	NS	None required. Noise heard by visitors would not change substantially from existing conditions.	NS
Reduced Footprint Alternative Same as Proposed Action.	NS	None required.	NS
No Project/ No Action Altern. The mine would be closed. Following closure and reclam-ation procedures, the Mine site would be quiet.	B	None required.	B
Air Quality			
Proposed Action Potential carcinogenic & non-carcinogenic health effects.	NS	None required.	NS

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Table S-1 (continued)

Summary of Potential Environmental Effects and Mitigation Measures, Proposed Mesquite Mine Expansion

Impact, by Environmental Topic	Level of Signifi-cance Without Mitigation	Mitigation Measures	Level of Signifi-cance With Mitigation
Air Quality (continued)			
Proposed Action Potential impacts to air quality from fugitive PM10 emissions from mine pit excavation, haul roads, heap leach pads, and OISAs.	S	PM10 air pollution control measures at the Mine will continue to use the following : • Wet drilling • Use of an enclosed baghouse for load-ing and unloading of lime • Enhanced watering of unpaved roads and activity areas (digging, handling and plac-ing of overburdent/interburden and ore) • Monitoring of PM10 concentrations at four perimeter stations on a 24-hour basis, to assure that no excessive fugitive PM10 travels off-site. • Use of chemical dust suppressants	CS
Potential impacts to air quality from emissions of mobile sources including loaders, haul trucks, cranes, etc.	NS	The Mine will continue a vigorous mobile equipment maintenance program to assure that the equipment is in good working condition, thus minimizing emissions.	NS
Potential emissions from onsite point sources, including fuel tanks, an electric smelting furnace, carbon kiln, a boiler, and an electrowinning cell.	NS	No additional mitigation measures required.	NS
Reduced Footprint Alternative Same as Proposed Action.	S, NS	Same as above for the Proposed Action.	NS

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Summary of Potential Environmental Effects and Mitigation Measures, Proposed Mesquite Mine Expansion

Impact, by Environmental Topic	Level of Significance Without Mitigation	Mitigation Measures	Level of Significance With Mitigation
Air Quality (continued)			
No Project/ No Action Altern. Until closure, emissions for this alternative would be similar to those of the Proposed Action.	S, NS	Same as identified above for the Proposed Action	CS
Termination of mining operations in 2001 instead of 2006 would marginally contribute to attainment of air quality standards.	B	None required.	B
Land Use			
Proposed Action The project would result in no significant impact to land use.	NS	None required.	NS
Reduced Footprint Alternative Same as Proposed Action.	NS	None required.	NS
No Project/ No Action Altern. The mine would be closed. Following closure and reclamation procedures, the Mine site would be returned to use as habitat.	NS	None required.	NS

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Table S-1 (continued)
Summary of Potential Environmental Effects and Mitigation Measures, Proposed Mesquite Mine Expansion

Impact, by Environmental Topic	Level of Signifi-cance Without Mitigation	Mitigation Measures	Level of Signifi-cance With Mitigation
Recreational Resources			
Proposed Action The project would result in no significant impact to recrea-tional resources or activities.	NS	None required.	NS
Reduced Footprint Alternative Same as the Proposed Action.	NS	None required.	NS
No Project/ No Action Altern. There would be no impact to recreational resources/activities.	NS	None required.	NS
Visual Resources			
Proposed Action Night lighting at the Mine could adversely affect the vision of Marine pilots at CMAGR.	S	Applicant shall ensure that project lighting is pointed toward the ground and not at sensitive receptors.	NS
Night lighting could affect driv-ers on SR 78 and campers near Glamis and Boardmanville.	S	Applicant shall ensure that project lighting is pointed toward the ground and not at sensitive receptors.	NS

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Table S-1 (continued)

Summary of Potential Environmental Effects and Mitigation Measures, Proposed Mesquite Mine Expansion

Impact, by Environmental Topic	Level of Signifi-cance Without Mitigation	Mitigation Measures	Level of Signifi-cance With Mitigation
Visual Resources (continued)			
Proposed Action (continued) Some of the OISA expansions will be located closer to SR 78. This will increase the observed size of these mounds incremen-tally over the OISAs already permitted.	NS	Applicant shall construct the proposed Mine expansion so that it resembles a natural landform to the extent practicable.	NS
Cumulative impacts associated with implementation of the un-built Mesquite Regional Landfill.	CS	Significant, unmitigable impacts are antici-pated to result from the Landfill Project. No mitigation would be effective in reducing the cumulative impact level of the Landfill Project plus the proposed Mine expansion, to less than significant.	CS
Reduced Footprint Alternative Same as the Proposed Action.	S, NS, CS	None required.	NS, CS
No Project/ No Action Altern. Following closure of the Mine, no night lighting would be needed.	NS	None required.	NS
OISAs and heap leach pads would continue to be enlarged, under existing permit conditions.	NS	None required.	NS

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Table S-1 (continued)

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Impact, by Environmental Topic	Level of Signifi-cance Without Mitigation	Mitigation Measures	Level of Signifi-cance With Mitigation
Environmental Health and Safety			
Proposed Action The Project potentially could result in impacts to environ-mental health and safety related to Mine blasting and use of heavy equipment, the cyanide heap leaching process, the gold recovery process, improper handling of domestic or industrial wastes, the transport and storage of chemical reagents and explosives, on-site accidents, mine equipment traffic accidents, and mine reclamation.	S	Applicant shall incorporate environmental health and public safety protection meas-ures required by local, State, or federal regulations into the design and operation	NS
Reduced Footprint Alternative Same as Proposed Action.	S	Applicant shall continue to incorporate envir-onmental health and public safety protection measures required by local, State, or federal regulations into the operation and closure.	NS
No Project/ No Action Altern. The Mine would be closed, but until then would be operated and closed in accordance with all applicable laws/regulations.	NS	None required.	NS

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Summary of Potential Environmental Effects and Mitigation Measures, Proposed Mesquite Mine Expansion

Impact, by Environmental Topic	Level of Signifi-cance Without Mitigation	Mitigation Measures	Level of Signifi-cance With Mitigation
Socioeconomics			
Proposed Action The Project would continue existing employment of 164 personnel until approximately 2006, and would add from 20-30 new staff members as well. This would result in continued and increased personal income, local sales and property taxes, and mineral extraction royalties to the State.	B	None required.	B
Reduced Footprint Alternative Same as Proposed Action.	B	None required.	B
No Project/ No Action Altern. The mine would be closed and the 164 existing employees would be laid off. This would decrease personal income and government revenues within the area.	SU	No mitigation is available or possible.	SU

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Table S-1 (continued)

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Impact, by Environmental Topic	Level of Signifi-cance Without Mitigation	Mitigation Measures	Level of Signifi-cance With Mitigation
Public Services and Utilities			
Proposed Action The Mesquite Mine is open and functioning as it has for the past 15 years. Public services and utilities to serve it are already in place, and would not require any substantive additions to accommodate the Proposed Action.	NS	Applicant shall supply all MSHA and Cal MSHA-required training, supplies, equipmt Applicant shall provide precipitation drainage facilities per Water Resources mitigation. Applicant shall provide on-site security, fire protection services, and medical services. Applicant shall provide a six- to eight-foot high industrial fence, except where existing fencing can be utilized. All proposed expan-sion areas would be fenced where necessary for security and to avoid unauthorized entry. All new fencing surrounding the proposed Mine expansion site would be constructed per BLM specifi-cations for tortoise fencing. Existing fencing would be further improved if required to successfully conclude consultation under Sec. 7 of the Endangered Species Act.	NS
Reduced Footprint Alternative Same as the Proposed Action.	NS	None required.	NS
No Project/ No Action Altern. The Mine would be closed, but until then it would utilize existing utility infrastructure, and Mine provided security and fire-fighting personnel. No additional utilities or services would be required.	NS	None required.	NS

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1 Introduction

1.1 BACKGROUND

On January 8, 1999 the County of Imperial Board of Supervisors accepted as complete, an application by the Newmont Gold Company (Newmont) for an amendment to a Conditional Use Permit for the Mesquite Mine. The Mesquite Mine is an existing open-pit mine that uses a cyanide heap-leach process to produce precious metals. The heap leach process is described in Section 2.1.2.3. Newmont's application is for an expansion of the existing Mesquite Mine, and includes an amendment to the existing Plan of Operations (POO) and revised Reclamation Plan.

The project proposes the expansion of the open-pit mines and overburden/interburden storage areas, and the expansion of the heap leach facilities. The Proposed Action involves the processing of approximately 89 million tons of ore and 242 million tons of waste rock from two existing pits. The project also includes the permitted expansion on approximately 91.6 acres of private land to accommodate the expansion Heap Leach Pad 6. As part of the proposed expansion, it is also necessary to construct ancillary facilities such as access roads and storm water diversion channels. The expansion encompasses 693 acres of federal, state and private (patented) land, of which 190 acres would be new disturbance, currently unpermitted. Approximately 332 of the remaining acres are already permitted, while the Big Chief Pit would also be extended into 171 acres of land previously disturbed by mining activities. The State Lands Commission (SLC) is concurrently processing an application for a mineral extraction lease regarding the expansion on 657.85 acres of land north of the Big Chief Pit-subject to SLC jurisdiction. Less than 97 acres of that area is proposed for disturbance.

In accordance with Public Resources Code Section 21151.7, *et seq.*, herein, California Environmental Quality Act (CEQA), an Environmental Impact Report is required for "any open-pit mining operation which is subject to the Surface Mining and Reclamation Act of 1975 and utilizes a cyanide heap-leaching process for the purpose of producing gold or other precious metals." For this reason, Imperial County has prepared this Environmental Impact Report (EIR) to address the environmental consequences of Newmont's proposal. The County of Imperial is the lead agency for the purpose of compliance with the requirements of CEQA for the Proposed Action.

The BLM determined that the Proposed Action would require an Environmental Impact Statement (EIS) for compliance with Public Law 91-90, 42 U.S.C. 4321, herein, National Environmental Policy Act (NEPA) and the BLM NEPA Handbook (BLM, 1988) and the implementing of Council on Environmental Quality (CEQ) Regulations (40 Code of Federal Regulations (CFR) Section 1500-1508). According to the CFR- Section 3809.1-7, a significant modification of an approved plan must be reviewed and approved by the authorized officer (i.e., BLM) in the same manner as the initial

plan. The proposed plan amendment would require discretionary actions by the County and BLM; and therefore, is both a project under CEQA and an action under NEPA.

Because the NEPA process for an EIS and the CEQA process for an EIR are similar, the documents can be completed in a combined format that accommodates the requirements of both agencies. CEQA and NEPA encourage such a cooperative effort for joint NEPA and CEQA planning processes, joint environmental research and studies, joint public hearings and joint environmental impact documents to reduce duplication of effort. This joint EIR/EIS, undertaken by the County of Imperial and the U.S. Bureau of Land Management, has been prepared to disclose environmental impacts to decision makers and the public, identify and prevent environmental damage, enhance public participation, foster intergovernmental coordination, and disclose agency decision making.

1.2 PURPOSE AND NEED FOR THE PROJECT

Current ore reserves included in the Mesquite Consolidated POO would be depleted no later than the middle of the year 2001. Ore reserves within the proposed expansion area could allow continuation of mine operations through the year 2006.

Newmont's primary purpose is to profitably recover precious metal known to exist from the staked mining claims at the Mesquite Mine. This objective, plus the other objectives of the Applicant and the lead and responsible/cooperating agencies define the purpose of the Mesquite Mine Expansion. These goals influence the analysis of alternatives in later chapters, primarily because the California Environmental Quality Act (CEQA) requires that the Environmental Impact Report (EIR):

"[d]escribe a range of reasonable alternatives to the project, or to the location of the project, which could feasibly attain the basic objectives of the project . . ." *(Guidelines § 15126.6(b)).*

The National Environmental Policy Act (NEPA) not only requires that an Environmental Impact Statement (EIS) describe a range of alternatives, but an EIS must:

"[r]igorously explore and objectively evaluate all reasonable alternatives" *40 --CFR § 1502.14.*

The objectives identified for this project are divided into separate categories because Applicant objectives, Imperial County objectives, Bureau of Land Management objectives, and the objectives of other participating agencies may be different. The following objectives are defined, in their totality, as the Project Objectives.

1.2.1 Proposed Action Objectives

1.2.1.1 Applicant's Objectives

- Profitably recover precious metal from the staked mining claims at the Mesquite Mine;
- Fully exercise their rights under the General Mining Law of 1872 as related to Federal lands;
- Develop minerals on California State lands in accordance with applicable regulations, as contained in Division 6 of the California Public Resources Code.
- Reclaim the project area in a manner that is environmentally responsible and in compliance with United States mining laws, the California Desert Conservation Area Plan, the Federal Land Policy and Management Act, the California Surface Mining and Reclamation Act and Imperial County's implementing regulations, and other applicable laws and regulations; and,
- Continue to provide employment to 167 employees of the Mesquite Mine.

1.2.1.2 Imperial County Objectives

- Maintain and continue to build Imperial County's economy by approving an environmentally and economically sound project that defers job loss associated with the closing of the Mesquite Mine;
- Reuse disturbed sites with existing infrastructure to allow continued employment, yet avoid undue degradation of the desert environment; and,
- Ensure conformance with the California Surface Mining and Reclamation Act (SMARA) and the County's Groundwater Management Ordinance.

1.2.1.3 U.S. Bureau of Land Management (BLM) Objectives

- Comprehensive management of public land to allow for the development of mineral resources under authority of the federal mining laws, while preventing unnecessary or undue degradation of federally administered and adjacent land.

1.2.1.4 Other Federal, State and Local Agencies' Objectives

- Ensure projects are not approved unless they are in conformance with all applicable federal, state, and local laws and regulations.

1.3 PROJECT BACKGROUND

1.3.1 General Location

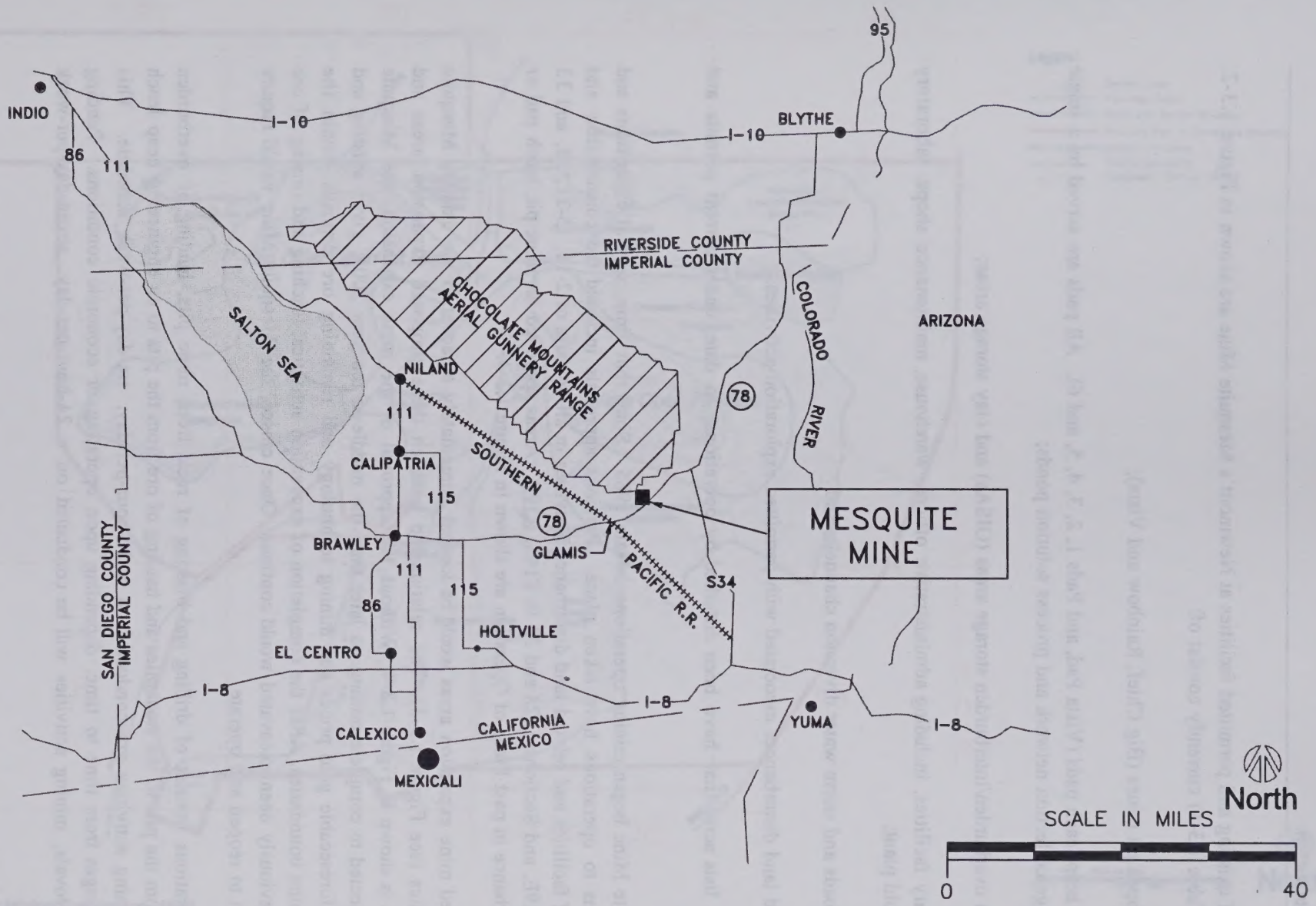
The Mesquite Mine is located in the Mesquite Mining District, at the southern end of the Chocolate Mountains, approximately 33 miles east of the City of Brawley in eastern Imperial County, California (Figure 1.3-1). The facility currently encompasses approximately 5,200 acres, of which 3,655 acres have been disturbed under existing permits and approvals. The total acreage on which disturbance has been permitted and approved is 4,962 under previous BLM and County approvals. The site is bordered to the north by the United States Department of the Navy Chocolate Mountains Aerial Gunnery Range (CMAGR) and to the east and south by California State Highway 78. The CMAGR is actively used by the U.S. Marine Corps for military aircraft training, including the delivery of live ordnance. The permanent Glamis Beach Store and the seasonal Boardman Store are located approximately 4.3 and 3.2 miles to the southwest of the Mine property, respectively. The unincorporated community of Palo Verde is located approximately 35 miles to the northeast.

1.3.2 Relationship to Existing Facilities

This section provides a brief description of the existing Mesquite Mine operations. A full description of how these existing facilities and operations would be affected by the proposed Mesquite Mine Expansion is provided in Chapters 2.0 (Alternatives Including the Proposed Action) and 4.0 (Environmental Consequences) of this EIR/EIS.

The Mesquite Mine began operations under an approved plan of operations (POO) during 1985. Since this time, several expansions and plan modifications have occurred, which are summarized within the approved Mesquite Mine Consolidated Plan of Operations (Consolidated POO), dated October 1995. Most of the mine property is owned by Hospah Coal Company, leased to Santa Fe Pacific Gold Corporation (SFPGC), and operated by Newmont Gold Company. SFPGC and Newmont Gold Company are subsidiaries of Newmont Mining Corporation. Newmont Mining Corporation is a Delaware corporation headquartered in Denver, Colorado. Newmont focuses on mining, recovery, and marketing of gold from its reserve holdings.

Operations at the Mesquite Mine consist of several open pits, overburden/interburden storage areas, heap leach pads, and ancillary facilities for the recovery of precious metals.



SOURCE: Newmont Mining Corporation, 1999

7/7/00

1-5

BRG CONSULTING, INC.

Mesquite Mine Expansion EIR/EIS

Site Location Map

FIGURE

1.3-1

The areas of existing and permitted facilities at Newmont's Mesquite Mine are shown in Figure 1.3-2. Facilities (Table 1.3-1) currently consist of:

1. three open pit mines (Big Chief, Rainbow and Vista);

2. seven heap leach pads (Vista Pad, and Pads 1, 2, 3, 4, 5, and 6). All pads are served by a single drainage collection network and process solution ponds;

3. fifteen overburden/interburden storage areas (OISAs) and clay storage areas;

4. ancillary facilities, including administrative offices, warehouse, maintenance shops, laboratory and gold plant;

5. haul roads and storm water diversion channels; and

6. limited land disturbances associated with permitted exploration activities.

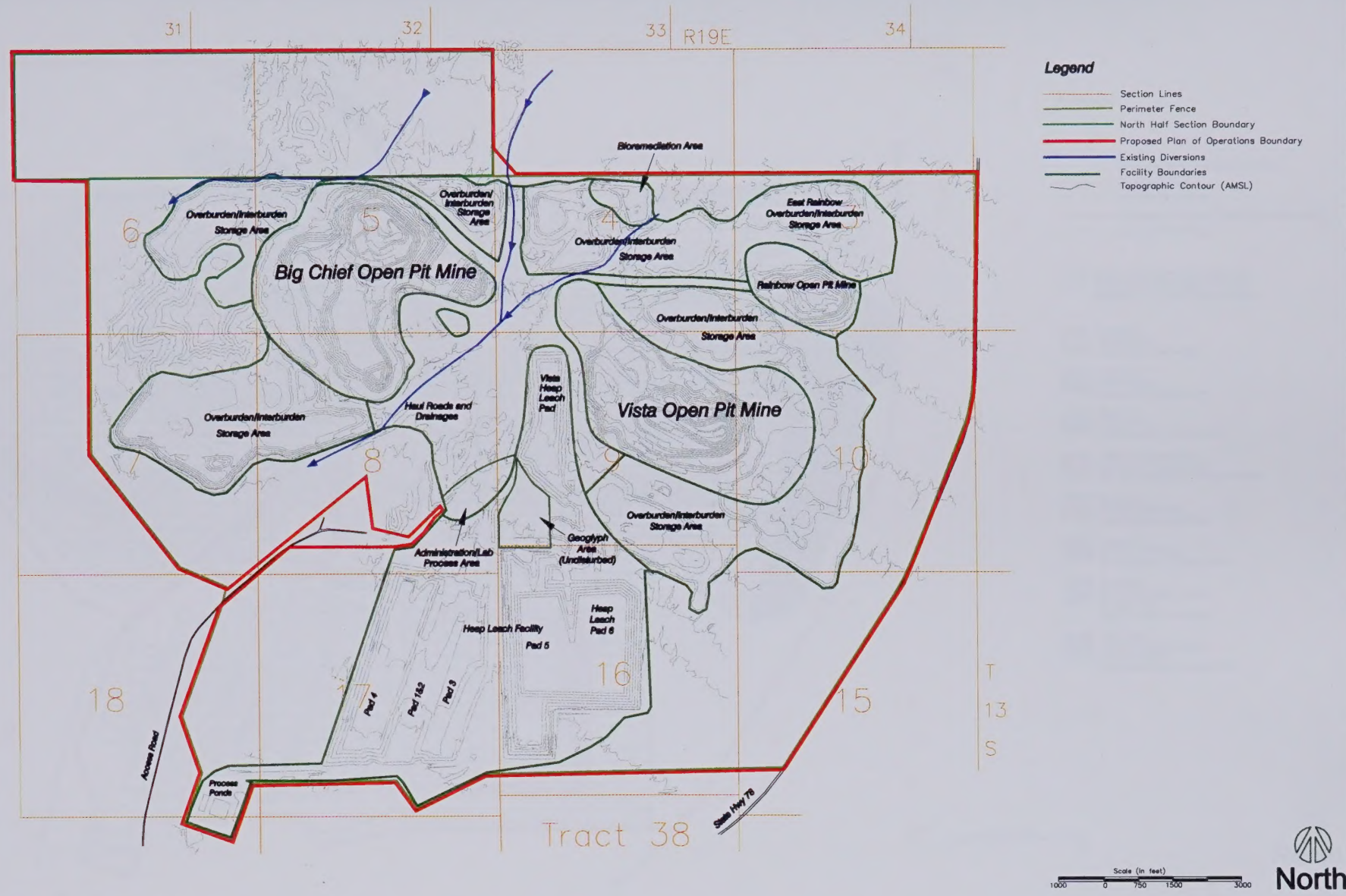
Table 1.3-1 lists acres that have been disturbed by operations, to date, under current permits and approvals.

The Mesquite Mine began mining operations in late 1985. Since that time, several expansions and modifications to operations have taken place. Previous approvals included the construction and operation of facilities and related land disturbance activities in all or parts of 2-11, 15-21, 28, and 33 in T13S, R19E, and Sections 4, 28 and 33 in T14S, R19E. Areas approved for mine pit, leach pad or OISA disturbance in past Plans of Operation are shown in Figure 1.3-3.

The proposed mine expansion areas would be located immediately adjacent to the existing Mesquite Mine facilities (see Figure 1.3-3). The relationship between these proposed expansion areas and public lands is shown in Figure 1.3-4. Without the approval of the mine expansion, the Mesquite Mine is expected to complete mining no later than the middle of the year 2001, given existing and reasonably foreseeable gold prices and mining technology and remaining ore deposits within the permitted mine boundaries. After the completion of excavation activities, leaching and rinsing of ore that had previously been excavated would continue. Once closed, the Mesquite Mine would require new permits to reopen and operate.

Mining operations consist of drilling and blasting of rock from mine pits, hauling of overburden materials from the pits to the stockpiles and hauling of ore from the pits to an engineered heap leach facility. Mining activities are conducted on a 20-hour-per-day, six-day-per-week schedule. This schedule changes from time to time, depending upon operating or economic conditions. Pending project approvals, mining activities will be conducted on a 24-hour-per-day, seven-day-per-week schedule.

In 1995, Imperial County and BLM approved the future construction and operation of the Mesquite Regional Landfill Project. This is a project of ARID Operations,and not Newmont Gold Company.



SOURCE: Newmont Mining Corporation, 1999

7/7/00

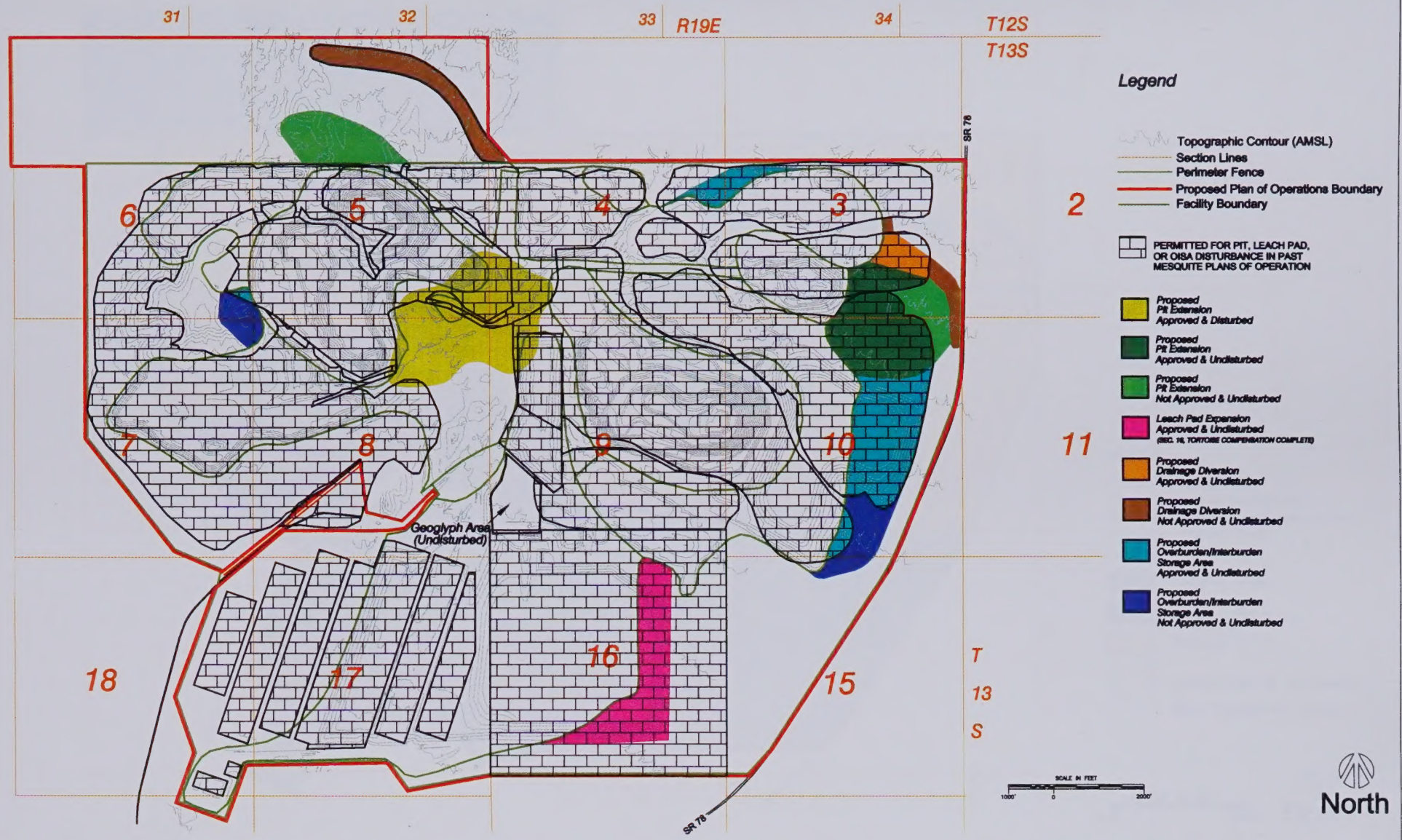
1-7

BRG CONSULTING, INC.

Mesquite Mine Expansion EIR/EIS

Existing Facility Layout

FIGURE 1.3-2



SOURCE: Newmont Mining Corporation, 1999

7/7/00

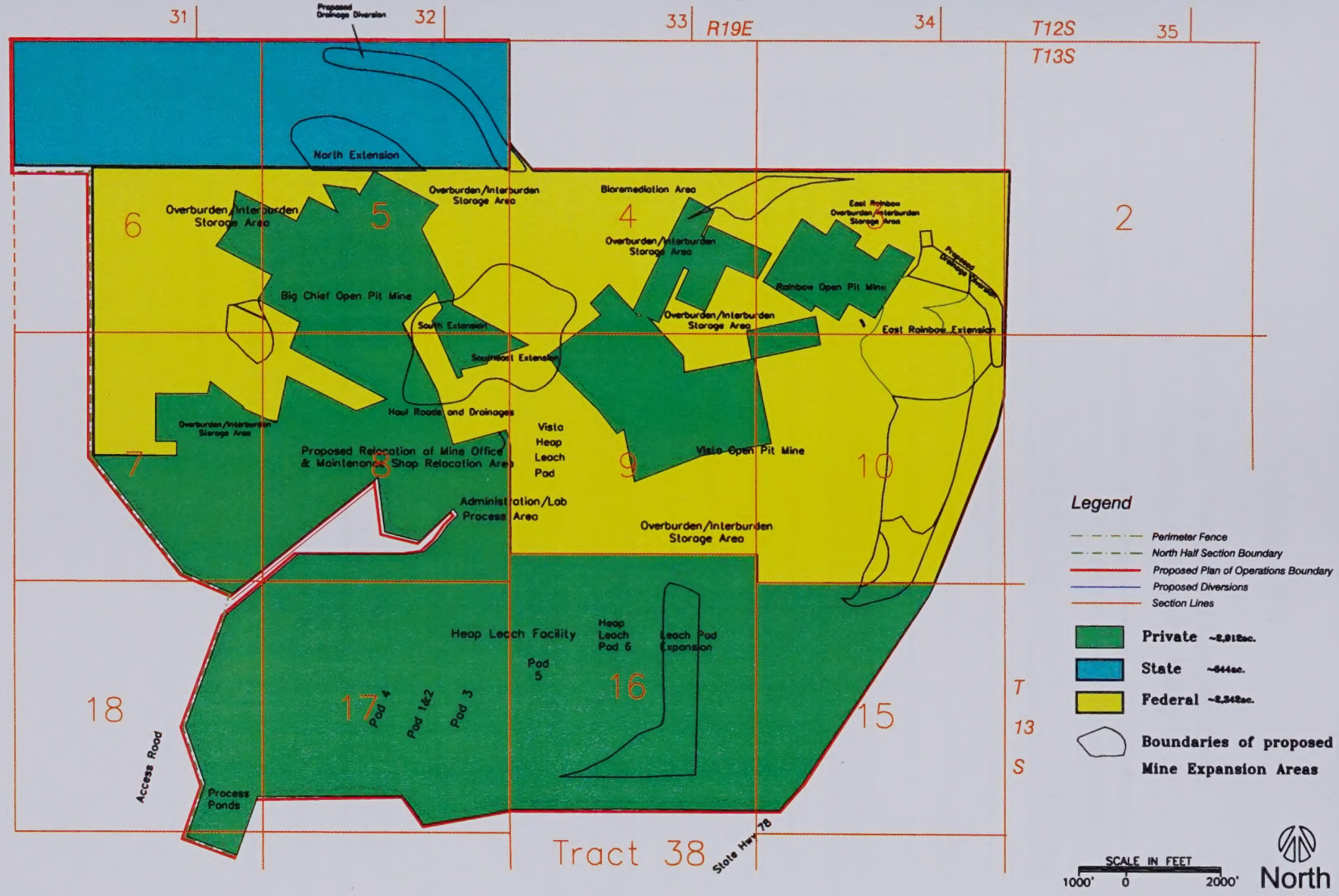
1-9

BRG CONSULTING, INC.

Mesquite Mine Expansion EIR/EIS

Proposed Mine Expansion Areas and Areas Having Existing Disturbance Permits

FIGURE 1.3-3



SOURCE: Newmont Mining Corporation, 1999, 2000

6/30/00

1-11

BRG CONSULTING, INC.

Mesquite Mine Expansion EIR/EIS

Land Status Within Proposed Plan of Operations Boundary

FIGURE 1.3-4

Table 1.3-1

Existing and Permitted Disturbance Acreage, Mesquite Mine

Facility	Acreage of Disturbance	
	Cumulative Allowable*	Existing
Open Pit Mines		
Big Chief		350
Rainbow		77
Vista		335
Open Pit Mine Subtotal	968	762
Heap Leach Pads		
Nos. 1, 2, 3, &4 (combined)		292
Pad 5		121
Pad 6		150
Vista Pad		82
Heap Leach Pad Subtotal		645
Ponds and Leach Facility Roads		258
Heap Leach Facility Total	1,145	903
Overburden/Interburden Storage Areas (OISA) (Includes Clay Stockpiles)	1,690	1,219
Ancillary Facilities**	1,159	771
TOTAL	**4,962**	**3,655**

Note: * Allowable under existing permits and approvals summarized in the current Consolidated Plan of Operations.

** Includes exploration disturbance, haul roads, and storm water diversion channels.

Source: Newmont Gold Company, 1999.

If the landfill project proceeds, it would be located on portions of and adjacent to the Mesquite Mine. The landfill would share some existing facilities with the mine.

1.3.3 Previous Environmental Documents

The following environmental documents were previously prepared for the Mesquite Mine or the Landfill site:

1. *Final Environmental Impact Report/ Environmental Assessment for the Mesquite Project, Imperial County, California* (SCH No. 84040408); prepared for and under the supervision of the BLM and the County of Imperial by The Butler Roach Group, Inc. (BRG Consulting, Inc.) and St. Clair Research Systems, Inc. dated December 12, 1984. This EIR/EA addressed the construction and operation of an open-pit gold mine and on-site ore processing facilities, located near Glamis in Imperial County, using the heap leaching/carbon absorption process.

2. *Final Environmental Assessment, EA No. CA 067-85-10, for the 161/92 kV TAP Substation and ROW Permit, No. CA 17187, for a 92 kV Transmission Line to the Gold Fields Operating Co.-Mesquite Site, Imperial County, California;* prepared for and under the supervision of the BLM and County of Imperial by The Butler Roach Group, Inc., and Environmental Solutions, Inc., dated May 10, 1985. This EA addressed the construction of electric transmission facilities to supply power to the Mesquite Project near Glamis in Imperial County, California.

3. *Final Environmental Impact Report/Environmental Assessment, EA No. CA-067-87-48, for the VCR Mining Project, Imperial County, California* (SCH No. 87052709); prepared for and under the supervision of the BLM and County of Imperial by Environmental Solutions, Inc., dated October 28, 1987. This EIR/EA addressed the approximate 2,000 acres to be developed with four open-pit mines, overburden and low-grade ore stockpiles, and modifications to SR 78. This project is an expansion of the previously proposed Mesquite mining operation.

4. Mesquite Mine Section 7 Consultation: The primary document associated with the Section 7 Consultation process is the Mesquite Mine Operations Biological Assessment for the Desert Tortoise (*Gopherus agassizii*), Bureau of Land Management, El Centro Resource Area, November 1991. The *Biological Opinion for the Continued Operations of Gold Fields Operating Company's Mesquite Mine* (BO No. 1-6-92-F-22) was issued by the U.S. Fish and Wildlife Service, Southern California Field Station, Carlsbad, on March 26, 1992 (as amended, per BLM, July 21, 1992).

5. *Final Environmental Impact Statement / Environmental Impact Report for the proposed Mesquite Regional Landfill Project, Imperial County, California* (SCH No. 92051024); prepared for and under the supervision of the Bureau of Land Management and the County of Imperial by The Butler Roach Group, Inc., dated June 30, 1995. This EIR/EIS addressed the 2,290-acre landfill proposed for portions of the Mesquite Mine property.

6. *Biological Opinion on the Proposed Chocolate Mountain Land Exchange, Imperial County, California (1-6-97-F-3).* This 1997 biological opinion addressed the proposed land exchange that resulted in State of California ownership of the two half-sections north of Big Chief pit.

7. *Biological Opinion on the Proposed Mesquite Mine Exploratory Drilling Project (PCN-98-20004-TCD), Imperial County, California (1-6-98-F-39).* This July 7, 1998 biological opinion addressed the proposed exploratory drilling program north of Big Chief pit.

These environmental documents are the most recent and comprehensive environmental documents that address existing environmental conditions in the vicinity of the proposed site. This EIR/EIS incorporates relevant information from these environmental documents. Where specific information from a previous document is used, the reference is identified within the text of this EIR/EIS.

All environmental documents listed above are hereby incorporated by reference and are available for public review during normal business hours at the following agencies: 1) County of Imperial Planning and Building Department, 939 Main Street, El Centro, California 92243 and 2) Bureau of Land Management El Centro Resource Area, 1661 South Fourth Street, El Centro, California 92243.

1.3.4 Previous Mine Approvals

The following section provides an overview of Mesquite Mine approvals obtained since 1984. Specific agency approval documents are listed by agency, following the overview.

- **Permits for Initial Development and Operation, 1984-85**
  Twenty-eight permits were required: 14 federal, 3 State of California, and 11 local (see Appendix A, Final EIR/EA for the Mesquite Project, Imperial County, California for the specific list). No U.S. Fish and Wildlife Service Biological Opinion, compensation, or Army Corps of Engineers 404 permit was required. The Corps of Engineers reviewed the Draft EIR/EA and declined jurisdiction, Nov. 2, 1984 (see Chapter 11, Comment Letter #7 in that same EIR/EA).

- **Permits for Expansion of the Mining Operation, 1987-88**
  Twenty-four permits were required: 12 federal, 3 State of California, and 9 local (see Appendix A, Final EIR/EA for the VCR Mining Project, Imperial County, CA, Oct. 28, 1987). The U.S. Fish and Wildlife Service reviewed the document, and made comments (see letter #1). No Biological Opinion, Consultation, or compensation was required.

- **Permits for Continued Operations of Goldfields Operating Company's Mesquite Mine, 1992**
  Biological Opinion 1-6-92-F-22, March 26, 1992. Proposed disturbance of all of Sec. 16 (640 acres) plus 20 acres of miscellaneous disturbance. Compensation consisted of 990 acres of land deeded to BLM by Goldfields on May 1, 1992.

- **Permits for Consolidated POO, 1995**
  No additional permits were required. The Consolidated POO simply compiled existing mine plans.

- **Permits for exploration in two northern half-sections, 1998**
  Biological Opinion 1-6-98-F-39, July 7, 1998. Exploration activities and drilling were anticipated to result in disturbance of 15 acres (Phases I and II); compensation for that disturbance was required at a 3:1 ratio. Forty-five acres of compensation were thus required, of which 9 must be microphyll woodland (to compensate for impacts to 3 acres of microphyll woodland). Completion of the compensation action is pending. Phase III of the program, comprising approximately 20 acres, was never undertaken.

  Newmont obtained a Nationwide Permit (NWP-26) regarding Section 404 of the Clean Water Act, dated July 8, 1998. California Dept. of Fish and Game 2081 and 1603 permits were obtained, as was Reclamation Plan RP97-005, issued by Imperial County.

  The permitted program of exploratory drilling was subsequently conducted in the northern halves of Sections 5 and 6 of T13S, R19E. This program consisted of 387 boreholes, of which only 154 boreholes were completed. Geologic and metallurgical evaluation of the drilling results is ongoing. The proposed expansion of the North Big Chief Open Pit Mine discussed in Section 4.0 of this Plan is based on current knowledge of that deposit.

Following is a listing of existing federal, state, and local approvals for the Mesquite Mine. These documents can be reviewed at the Bureau of Land Management, 1661 S. Fourth St., El Centro, California 92243; or at the Imperial County Planning and Building Department, 939 Main Street, El Centro, California 92243.

FEDERAL AGENCIES

Bureau of Land Management:

The Mesquite Mine Consolidated Plan of Operations 1995

The Plan of Operations Amendment Narrative Optimization of Operating Plans 7/12/89

The VCR Plan of Operations (BLM No. CAMC 109887/121229) 11/4/87

EIR/EA certified as adequate by BLM (BLM No. CA-067-87-48) 11/2/87

The Mesquite Plan of Operations (BLM No. CAMC 81188/261) January, 1985

EIR/EA certified as adequate by BLM (BLM No. CA-067-85-05) 12/27/84

Fish and Wildlife Service

Biological Assessment, Section 7 Consultation, Biological Opinion (Endangered Species Act, 16 USC 1531-1544), 1992, 1998

STATE AGENCIES

California Regional Water Quality Board:

Waste Discharge Requirement (Cal Water Code 13000 *et seq.*) Permits 1985, 1988, 1991, 1998.

Department of Fish and Game

California Endangered Species Act 2081 Permit, #2081-1998-26-6

California Streambed Alteration 1603 Permit, #5-184-98, 6/23/98

California State Lands Commission

State Mineral Prospecting Permit (PRC 8039.2)

LOCAL AGENCIES

Imperial County Air Pollution Control District:

Newmont Mesquite Mine, Permit No. 1920A-4, Mining Gold Plant

Newmont Mesquite Mine, Permit No. 1920A-9, Mining Mobile DSL

Newmont Mesquite Mine, Permit No. 1920A-10, Mining Petroleum Storage

Newmont Mesquite Mine, Permit No. 2613, Misc. (soil remediation)

Newmont Mesquite Mine, Permit No. 2667, Mining

Imperial County Board of Supervisors:

Reclamation Plan RP97-005 - plan for reclamation of lands in the two north half-sections after exploratory drilling; 5/27/98.

File No. 96-0037 – (Amendment 4 to Conditional Use Permit 786-88 approved by Planning Commission 1/8/97, recorded 7/9/97

File No. 96-0026 – (Amendment 4 to Conditional Use Permit 684-84 approved by Planning Commission 1/8/97, recorded 7/9/97

Conditional Use Permit 786-88 (VCR expansion)

Conditional Use Permit 788-88 (gravel crushing/hot batch plant) – temporary 1 year

Conditional Use Permit 684-84 (Goldfields, also referred to as "Mesquite")

Conditional Use Permit 598-82 (finite heap leach test project) - 1 year

Conditional Use Permit 503-81 (Mining Mgmt. Inc.) - original mining Conditional Use Permit for the area

Imperial County Department of Environmental Health

Solid Waste Disposal Permit Exemption

1.4 RELATIONSHIP TO IMPERIAL COUNTY POLICIES, PLANS, AND PROGRAMS

1.4.1 Imperial County Planning/Building Department

The Imperial County Planning/Building Department is responsible for implementing policies that guide land use and development in Imperial County. The proposed mine expansion would require a Conditional Use Permit (CUP) and Building Permits from the Imperial County Planning/Building Department before it can begin mining operations in the presently unpermitted expansion areas. A separate CUP would also be required to provide for joint usage of the existing Gold Fields water wells by the Mesquite Mine and the approved but as yet unbuilt Mesquite Regional Landfill. The County of Imperial is the lead agency for CEQA purposes.

The CUP would regulate the overall project and would include conditions of approval to ensure implementation of the project design features and mitigation measures identified in this EIR/EIS and additional mitigation measures required for permitting of the Proposed Action.

Imperial County is also the local agency responsible for implementing the California Surface Mining and Reclamation Act (SMARA).

1.4.2 Imperial County Air Pollution Control District

The Imperial County Air Pollution Control District (ICAPCD) is responsible for issuing permits that satisfy all district, state, and federal air quality rules and regulations, including new and modified stationary source review (APCD Rule 207). Based on recent discussions with ICAPCD, Newmont's

existing Authority to Construct and Permit to Operate will be modified to incorporate the proposed facilities. Upon completion of the approval process, a revised Authority to Construct and a Permit to Operate and amendments thereto would be issued by the ICAPCD for the Mesquite Mine Expansion.

1.5 RELATIONSHIP TO BLM POLICIES, PLANS, AND PROGRAMS

The project area is located within the Bureau of Land Management California Desert Conservation Area. BLM manages all activities on federal lands within the CDCA through the 1980 California Desert Conservation Area Plan as amended, prepared under the Federal Land Policy and Management Act of October 21, 1976 (43 U.S.C. 1701 et seq., herein, FLPMA). BLM is the lead agency for NEPA review of the Proposed Action.

Most federal land within the project area is managed by the BLM for multiple uses (Class M). The Class M lands designation provides for a wide variety of present and future uses such as mining, livestock grazing, recreation, energy, and utility development. Its objective is a controlled balance between higher intensity uses and the protection of public lands. The project will comply with all provisions of Federal Land Policy and Management Act of 1976 (FLPMA).

A reclamation plan that conforms to BLM Manual Handbook H-3042-1 is included in the Plan of Operations (POO), which was revised as of November 12, 1999. The POO and Reclamation Plan are available for review at El Centro offices of the BLM and the County of Imperial, as well as the BLM State office in Sacramento, and the offices of BRG Consulting, Inc. in San Diego.

A California Cyanide Management Plan per BLM 1992 has been prepared and is available for review during normal business hours at the BLM El Centro Resource Area offices, 1661 South Fourth Street, El Centro, California, 92243.

1.6 RELATIONSHIP TO OTHER GOVERNMENTAL POLICIES, PLANS & PROGRAMS

1.6.1 Federal Agencies

1.6.1.1 Environmental Protection Agency (U.S. EPA)

The U.S. Environmental Protection Agency (U.S. EPA) is responsible for developing and implementing most aspects of environmental policy in the United States. The following major laws, implementation of which is administered by the U.S. EPA, would apply to the Proposed Action.

- Resource Conservation and Recovery Act (RCRA), Subtitle C - This law and supporting regulations apply to the management of hazardous wastes. Hazardous wastes would not be deposited at the proposed Mesquite Mine Expansion. Hazardous wastes may be created and stored in accordance with state and federal regulations, at the proposed expansion. Procedures to handle these materials would be implemented in accordance with RCRA Subtitle C.

- Clean Air Act (CAA) - This law sets standards for air emissions throughout the country. Applicable programs established by this law include: the National Ambient Air Quality Standards (NAAQS), which set maximum allowable concentrations for certain criteria pollutants; Prevention of Significant Deterioration (PSD) Program, which is designed to protect areas that have not exceeded NAAQS; New Source Performance/Review Program, which sets standards for stationary source emissions; and the Mobile Source Emission Standards, which set standards for vehicles. Under the provisions of the federal CAA, the California Air Resources Board (CARB) and the ICAPCD administer the federal CAA in California.

- Clean Water Act - This law establishes maximum contaminant levels (mcls), among other things, for protection of water resources throughout the United States. The California State Water Resources Control Board (SWRCB) and the nine Regional Water Quality Control Boards (RWQCBs) administer the federal Clean Water Act in California.

1.6.1.2 U.S. Fish and Wildlife Service (USFWS)

The U.S. Fish and Wildlife Service (USFWS) has been charged with the responsibility to monitor the status of wild populations of certain flora and fauna, and to identify those that are in danger of extinction (endangered species) or are likely to become endangered in the foreseeable future (threatened species). Lists of these species are maintained by the agency. Potential impacts to federal listed species require consultation with the USFWS, as stated under Section 7 of the federal Endangered Species Act (ESA). If the USFWS advises a federal agency that a listed species may be present in the area of a proposed agency action, the agency must conduct a biological assessment to determine whether its proposal is likely to affect any listed species. If the assessment concludes that a protected species may be affected, the agency must initiate formal consultation with USFWS. Based upon the results of the formal consultation, USFWS must issue a written biological opinion. In its written opinion, USFWS determines if an action would jeopardize the continued existence of a listed species. Any "incidental take" of a listed species must be authorized by USFWS.

1.6.1.3 Advisory Council on Historic Preservation (ACHP)

Section 106 of the National Historic Preservation Act of 1964 requires federal agencies to provide the Advisory Council on Historic Properties (ACHP) an opportunity to comment on any project on federal lands, or projects that are federally funded or permitted, that have a potential to affect properties included in or eligible for inclusion in the National Register of Historic Places (NRHP). BLM has an agreement with ACHP that limits ACHP's involvement in BLM actions unless BLM cannot reach a determination of No Adverse Effect with the State Historic Preservation Officer (SHPO).

1.6.1.4 U.S. Department of Labor

The U.S. Department of Labor is responsible for labor policy, among other things, throughout the United States. The Mine Safety and Health Administration in the U.S. Department of Labor would enforce laws concerning worker safety at the proposed Mesquite Mine Expansion.

1.6.1.5 U.S. Army Corps of Engineers

Section 404 of the Clean Water Act authorizes the Secretary of the Army, acting through the Chief of Army Corps of Engineers, to issue permits for the discharge of dredged or fill material into the Waters of the United States, including wetlands. The term "Waters of the United States" has a broad meaning and incorporates both deepwater aquatic habitats and special aquatic sites, including wetlands, as follows:

- The territorial seas with respect to the discharge of fill material.
- Coastal and inland waters, lakes, rivers, and streams that are navigable Waters of the United States, including their adjacent wetlands.
- Tributaries to navigable Waters of the United States, including adjacent wetlands.
- Interstate waters and their tributaries, including adjacent wetlands.
- All other Waters of the United States not identified above, such as isolated wetlands and lakes, intermittent streams, prairie potholes, and other waters that are not a part of a tributary system to interstate waters or navigable Waters of the United States, the degradation or destruction of which could affect interstate commerce.

1.6.2 State Agencies

1.6.2.1 State Water Resources Control Board (SWRCB)

The SWRCB is the responsible agency for implementing the federal Clean Water Act in the State of California. In California, the Clean Water Act, as it pertains to mining activities, is implemented through Title 23, Chapter 15, Discharges of Waste to Land and Chapter 3, Water Resources Control Board, California Code of Regulations (CCR), as adopted on October 18, 1984. The Porter Cologne Water Quality Control Act, updated in 1989, regulates contaminants in surface or ground water in the State of California.

The SWRCB oversees the regulatory activities of the nine Regional Water Quality Control Boards (RWQCBs) in California. For the proposed Mesquite Mine Expansion, the Lower Colorado River RWQCB is the responsible agency for the Waste Discharge Requirements (WDRs) and National Pollution Discharge Elimination System (NPDES) Permits.

CCR Title 23, Chapter 15, Article 5 was recently established to require that holders of WDRs provide financial assurance of their ability to fund potential corrective action programs in the event that contamination of waters of the state occur from their actions.

1.6.2.2 California State Lands Commission (CSLC)

CSLC is responsible for managing four million acres of sovereign lands composed of tidal and submerged lands, navigable lakes, rivers and streams and 1.2 million acres of school lands granted to the State to benefit public education. Under Division 6 of the California Public Resources Code, the CSLC is directed to manage school lands incorporating a multiple use concept for land use planning. These uses have included recreation; research; farming, grazing, timber harvesting, oil, gas and geothermal development; mineral exploration, and mining while protecting the associated environmental resources. The CSLC is currently processing a mineral extraction lease application for 657.85 acres of land, of which approximately 97 acres would be disturbed by the proposed Mesquite Mine expansion.

1.6.2.3 California Air Resources Board (CARB)

CARB is responsible for enforcing state air pollution regulations. California has established 34 air quality management districts (AQMDs) and air pollution control districts (APCDs). CARB is responsible for overseeing that all AQMDs and APCDs air quality programs are being carried out effectively to meet all state and federal air quality standards. CARB is also responsible for regulating mobile sources. The Imperial County APCD (ICAPCD) is the agency responsible for air quality permitting, enforcement and air monitoring in Imperial County.

1.6.2.4 California Department of Fish and Game (CDFG)

The California Department of Fish and Game (CDFG) is responsible for state policies concerning fish contained in the state's waters and wildlife within the state borders. CDFG is responsible for the implementation and enforcement of the California Endangered Species Act of 1984 and the California Native Plant Protection Act of 1977. The CDFG will evaluate potential streambed alteration issues for the desert washes in the project area in accordance with Section 1603 of the California Fish and Game Code.

The Department is the state agency responsible for issuance of California Endangered Species Act (CESA) incidental take permits under Sections 2080-2081 of the California Fish and Game Code. Once a project has obtained an incidental take authorization under the federal Endangered Species Act for a species that is both federally and state listed, then the project proponent may apply to the Director of the Department for a determination of consistency under CESA. If the Director determines that the federal incidental take authorization is consistent with the goals and requirements of CESA, or if the Department fails to respond within 30 days of receiving the project proponent's petition, then no further authorization or approval is necessary. If the Director should determine that the federal authorization for the Proposed Action is not consistent with CESA under Section 2080.1 of the state Act, then the project proponent will be required to obtain a CESA incidental take permit from the Department.

1.6.2.5 State Historic Preservation Officer (SHPO)

BLM and SHPO have a State Protocol Agreement by which they cooperatively implement the National Programmatic Agreement among the Bureau of Land Management, the Advisory Council On Historic Preservation, and the National Conference of State Historic Preservation Officers regarding the manner in which BLM will meet its responsibilities under the National Historic Preservation Act. Under the State Protocol Agreement, BLM shall consult with SHPO under certain circumstances, including undertakings having an adverse effect as defined by 36 CFR 800.9(b) and undertakings where traditional cultural properties or sacred sites may be affected.

1.6.2.6 California Department of Transportation (Caltrans)

The California Department of Transportation (Caltrans) has jurisdiction over state highways throughout California. Caltrans issues encroachment permits to land within its jurisdiction to ensure that the encroachments are compatible with the primary uses of the state highway system; to ensure the safety of the permittee and highway users; and to protect the State's investment in the highway facility that would be encroached upon. The Applicant would submit an application for an encroachment permit to allow the construction of any changes to storm water swales on State Route 78, if deemed necessary.

1.6.2.7 California Department of Conservation (DOC)

The Department of Conservation (DOC) has certain responsibilities pursuant to California's Surface Mining and Reclamation Act (SMARA). Prior to the commencement of surface mining operations, SMARA requires that mine operators obtain reclamation plan approval and establish a financial guarantee for reclamation. Approved plans must be amended, and those amendments approved, prior to substantial deviations. The reclamation plan, amendments, and financial assurances must be approved by the lead agency (city or county where the mine is located). Prior to approval, the lead agency is required to forward a copy of the reclamation plan and financial assurance to DOC for a thirty and forty-five day review respectively. Mine operators are required to file an annual report with and pay an annual fee to DOC. DOC has a statutory responsibility to ensure that mine operators are in compliance with SMARA and that lead agencies meet their responsibilities pursuant to SMARA. DOC also maps mineral occurrences of regional and statewide significance. The maps are provided to lead agencies for use in making land management decisions so that the production and conservation of mineral resources are encouraged.

1.6.3 Relationship to Other Governments

1.6.3.1 Quechan Indian Tribe

The Quechan Indian Tribe, through consultation with BLM, participates in the decision-making process as it concerns the Tribe's cultural practices and religious beliefs and practices.

1.7 AUTHORIZING ACTIONS

Based on responses from federal, state, and local governmental agencies during the scoping process and in response to the "Notice of Intent to Prepare an EIS" (NOI) and "Notice of Preparation of an EIR" (NOP), a number of authorizing actions have been identified that will be required prior to implementation of the proposed Mesquite Mine Expansion. Table 1.7-1 provides a summary of these actions.

1.8 PURPOSE OF THIS DOCUMENT

The purpose of this joint EIR/EIS is to provide the necessary environmental information to the public as well as decision-makers at the lead, responsible, and cooperating agencies in order to consider the proposed expansion of the Mesquite Mine.

Current mine operations consist of several open pits, overburden/interburden storage areas (OISAs), heap leach pads and associated ancillary facilities for the recovery of precious metals. This EIR/EIS document is for the proposed, but currently unpermitted, expansion of the following existing facilities:

- Extensions of the Big Chief Open Pit Mine;
- Extension of the Rainbow Open Pit Mine;
- Expansion of overburden/interburden storage areas; and,
- Construction of drainage diversions.

It is anticipated that these proposed expansions would allow Mesquite operations to continue through the year 2006 or longer, depending on economics.

The environmental analyses presented in this EIR/EIS are generally conservative. "Best" and "Worst" case analyses were avoided in favor of more balanced "Maximum Likelihood" analyses. This approach was adopted to provide the reader with an understanding of the environmental effects that are likely to occur, and not to affect the reader's understanding by presenting environmental effects that are unlikely to occur. CEQA does not require "worst case" analyses. Maximum likelihood analyses are allowed by NEPA provided they are supported by credible scientific evidence, are not based on pure conjecture, and are within the rule of reason (40 CFR 1502.22(b)(4)).

Table 1.7-1

Summary of Required Permits/Actions for Proposed Mesquite Mine Expansion

Agencies	Permit/Action
Federal	
Advisory Council on Historic Preservation (Per an existing agreement, ACHP only is involved if BLM cannot reach a determination of No Adverse Effect with the State Historic Preservation Officer)	Consult with BLM, SHPO, and consulting parties on undertakings having an adverse effect (Sec. 106 of the National Historic Preservation Act of 1964)
Bureau of Land Management El Centro Resource Area	Approve Plan of Operations amendment for mine and process operations, including Reclamation Plan (Federal Land Policy and Management Act of 1976)
	Initiate consultation under Section 7 of the Endangered Species Act
	Complete consultation under Section 106 of the National Historic Preservation Act of 1964
	Publish Record of Decision on EIS (National Environmental Policy Act of 1969)
Bureau of Alcohol, Tobacco and Firearms	Approve Use of High Explosives Permit
United States Army Corps of Engineers	Approve individual permit to dredge or fill Waters of the U.S. under the Clean Water Act, Section 404
United States Fish and Wildlife Service	Review Biological Evaluation (Section 7 of the Endangered Species Act) Issue Biological Opinion (Section 7 of the Endangered Species Act)

Table 1.7-1
Summary of Required Permits/Actions for Proposed Mesquite Mine Expansion

Agencies	Permit/Action
State of California	
California Department of Fish and Game	Review Biological Evaluation. Issue CESA Incidental Take Permit (Sections 2080-2081, California Fish and Game Code) Issue Streambed Alteration Agreement (Section 1603 of the California Fish and Game Code)
California Department of Transportation (Caltrans)	Issue permits necessary for improvements to state roads or within Caltrans rights-of-way (encroachment permit)
California Department of Parks and Recreation, State Historic Preservation Office (SHPO)	Consult with BLM under the State Protocol Agreement when thresholds for SHPO review are met.
California Regional Water Quality Control Board Colorado River Basin Region	Approve Waste Discharge Requirements for discharges of waste to land (Title 23, Chapter 15 of California Code of Regulations)
	Approve National Pollution Elimination System Permit (NPDES) for Storm Water Discharge During Construction (Clean Water Act)
	Approve National Pollution Elimination System Permit (NPDES) for Storm Water Discharge from Industrial Facilities (Clean Water Act)
	Approve Certificate of Compliance with Section 401 of the federal Clean Water Act
California State Lands Commission	Approve Mineral Extraction lease (Division 6, California Public Resources Code)

Table 1.7-1

Summary of Required Permits/Actions for Proposed Mesquite Mine Expansion

Agencies	Permit/Action
Local Jurisdictions	
Imperial County Board of Supervisors	Approve Conditional Use Permit Amendment and Reclamation Plan for mine expansion Approve Conditional Use Permit Amendment for use of water from the Mesquite Mine water wells Certify this EIR (California Environmental Quality Act) Approve Mitigation, Monitoring and Reporting Program (California Environmental Quality Act)
Imperial County Air Pollution Control District	Modify existing Authority to Construct, Permit to Operate, and approve the revised permits.
Imperial County Fire Department	Approve Plan Review for compliance with Uniform Fire Code
Imperial County Department of Health Services	Approve Water System Permit
Imperial County Planning/Building Department	Approve Building Permits
Imperial County Department of Public Works	If necessary, revise Ground Water Extraction Permit Approve new Mesquite water well permit

Source: BRG Consulting, Inc., 2000.

1.9 CRITICAL ELEMENTS OF THE HUMAN ENVIRONMENT

BLM Handbook H-1790-1 identifies the critical elements of the human environment that must be addressed in Environmental Impact Statements. Table 1.9-1 presents the critical element, the relevant authority, and a brief discussion of each element as it relates to the Proposed Action and alternatives. This table identifies the Section in this EIR/EIS that discusses each of these elements and also identifies elements that would not be affected by the Proposed Action or Alternatives, and are not further discussed in this EIR/EIS.

1.10 SCOPING

In accordance with NEPA and the BLM Handbook, public scoping meetings were held for the Proposed Action. The first meeting was held on January 26, 1999 at the Best Western Inn Suites Palm Canyon Room in Yuma, Arizona. The second meeting was held on January 27, 1999 at the El Centro Community Center in El Centro, California. A third meeting was held on January 28, 1999 at the San Diego State University Aztec Center Backdoor Room in San Diego, CA. There were 63 people in attendance at these meetings.

Key issues identified by the public at these meetings include visual and socioeconomic impacts, water and storm drainage, biology, land use, future expectations, new impact area, utilities, existing setting, EIR/EIS document process, air quality and water quality impacts, previous permits, alternatives, and protection of on-site cultural resources/sacred sites. Additional details are contained in Appendix A-1 of this EIR/EIS.

1.11 Notice of Preparation, Notice of Intent and Responses

A Notice of Preparation (NOP) of a Draft Environmental Impact Report/Statement for the Mesquite Mine Expansion was published in the San Diego Union Tribune on December 14, 1998. On December 28, 1998 the Bureau of Land Management published the Notice of Intent (NOI) in the Federal Register. The NOP, NOI, and responses received are contained in Appendix A-2 of this EIR/EIS.

Table 1.9-1

Critical Elements of the Human Environment
Proposed Mesquite Mine Expansion

Element	Relevant Authority	Discussion
Air Quality	The Clean Air Act, as amended (42 USC 7401 et seq.)	The Proposed Action has the potential to release air pollutants. These emissions are analyzed in the Air Quality Section of this EIR/EIS.
Areas of Critical Environmental Concern	Federal Land Policy and Management Act of 1976 (43 USC 1701 et seq.)	Impacts are addressed in the Cultural Resources and Land Use Section of this EIR/EIS
Cultural Resources	National Historic Preservation Act, as amended (16 USC 470)	Proposed Action impacts are addressed in the Cultural Resources Section of this EIR/EIS.
Farm Lands (prime and unique)	Surface Mining Control and Reclamation Act of 1977 (30 USC 1201 et seq.)	There are no prime or unique farmlands on the proposed site. No further discussion of this element is provided in this EIR/EIS.
Floodplains	Executive Order 11988, as amended, Floodplain Management, 5/24/77	Storm water runoff effects are addressed in the Geology/Soils/ Mineral Resources and Water Quality Sections of this EIR/EIS.
Native American Religious Concerns	American Indian Religious Freedom Act of 1978 (42 USC 1996)	Native American religious concerns are addressed in the Cultural Resources section of this EIR/EIS.
Threatened or Endangered Species	Endangered Species Act of 1973, as amended (16 USC 1531)	Threatened and endangered species occur in the vicinity of the Proposed Action. Impacts are discussed in the Biological Resources section of this EIR/EIS.
Wastes, Hazardous or Solid	Resource Conservation and Recovery Act of 1976 (42 USC 6901 et seq.); Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (42 USC 9615)	Mining activities from the Proposed Action generate by-products that are considered hazardous waste. The effects of these wastes are discussed in the Water Quality and Environmental Health and Safety Section of this EIR/EIS.
Water Quality, Drinking/ Groundwater	Safe Drinking Water Act, as amended (42 USC 300f et seq.); Clean Water Act of 1977 (33 USC 1251 et seq.)	The Proposed Action has the potential to affect water quality. These effects are discussed in the Water Quality Section of this EIR/EIS.
Wetlands/ Riparian Zones	Executive Order 11990, Protection of Wetlands, 5/24/77	Wetlands are addressed in the Biological Resources Section of this EIR/EIS.
Wild and Scenic Rivers	Wild and Scenic Rivers Act, as amended (16 USC 1271)	There are no wild and scenic rivers in the project area.
Wilderness	Federal Land Policy and Management Act of 1976 (43 USC 1701 et seq.); Wilderness Act of 1964 (16 USC 1131 et seq.); California Desert Protection Act of 1994 (16 USC 410 et seq.)	There are no wilderness areas at or near the Mesquite Mine.

Source: BRG Consulting, Inc., 2000.

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2 Alternatives Including the Proposed Action

On January 8, 1999, the County of Imperial Board of Supervisors accepted as complete the Newmont Gold Company (Newmont) application to amend the Conditional Use Permit for the Mesquite Mine to allow additional mine expansion. Expansion facilities were detailed initially in the November 1998 POO. During 1999, environmental studies of the expansion were undertaken, and Newmont personnel participated in numerous discussions with the lead and responsible agencies regarding project environmental and permitting issues. As a result, an alternative expansion plan, called the "Reduced Footprint Alternative" was developed in order to minimize surface disturbance by expanded mine activities, and thus to minimize several environmental impacts, associated with biological resources, cultural resources, etc. Concurrently, permitted gold exploration activities in the two half-sections of State land located north of the existing Big Chief Pit more clearly delineated ore locations and quantities in that area. The results of this work are a modified Proposed Action, which essentially incorporates mining increased ore quantities into the November 1998 POO, and the Reduced Footprint Alternative which is detailed in the November 1999 POO and incorporates mining increased ore quantities and decreased facility footprints.

2.1 PROPOSED ACTION

2.1.1 Proposed Action Site

The existing 5,200-acre Mesquite Mine is located in eastern Imperial County south of the Chocolate Mountains Aerial Gunnery Range and north of Highway 78 (Township 13 South, Range 19 East, San Bernardino Meridian). The Proposed Action includes disturbance of an additional 522.2 acres. However, 332.7 of the 522.2 acres have been previously permitted for disturbance as summarized in the Consolidated POO. As shown in Figure 1.3-2, the Proposed Action is located partially within the existing Consolidated Plan of Operations permitted project boundary (Consolidated POO, Santa Fe, 1995), and would allow for the continued extraction and processing of economical gold deposits, delineated by drilling programs initiated during 1988 and continuing to date. The areas of existing disturbance are shown in Figure 2.1-1. Projected acres of disturbance by proposed expansion area is shown in Table 2.1-1. The project proposes expansion of two existing pits: the Big Chief and Rainbow open pits (See Section 2.1.5.1). The proposed pit extensions would encompass 177 acres of undisturbed public lands (North Big Chief and East Rainbow) of which, 101 acres would be permitted, and 76 acres would be unpermitted. In addition, the Big Chief Pit would be extended 171 acres into areas previously disturbed by other mining activities to the south and to the southeast. These latter extensions do not require any additional permits beyond those already issued. Figure 2.1-1 shows the proposed new disturbance, and previously approved areas.

Table 2.1-1
Comparison of Areas For Each Proposed Facility, By Major Alternative

Proposed Facilities	Proposed Action			Reduced Footprint Alternative		
	Proposed Area (AC.)	Permitted Disturbance (AC.) (a)	New, Unpermitted Disturbance (Acres)	Proposed Area (AC.)	Permitted Disturbance (Acres) (a)	New, Unpermitted Disturbance (Acres)
Mine Pits						
Big Chief						
North Extension	51.2	0	51.2 (d)	51.2 (d)	0	51.2 (d)
South/Southeast Ext.	171. (b)	NA	NA	171. (b)	NA	NA
Big Chief Subtotal	*222.3*	*0*	*51.2*	*222.3*	*0*	*51.2*
East Rainbow Extension	126.0	100.9	25.1	126.0	100.9	25.1
OISAs						
Big Chief West	21.2	2.6	18.6	-	-	-
East Rainbow North	22.0	22.0	0	5.7	5.7	0
East Rainbow South	132.1	98.8	33.3	103.4	98.8	4.6
Subtotal OISAs	*175.3*	*123.4*	*51.9*	*109.1*	*104.5*	*4.6*
Heap Leach Pad 6	91.6 (c)	91.6(c)	0	91.6(c)	91.6(c)	0
Drainage Diversions						
North Extension	45.3	0	45.3	45.3	0	45.3
East Rainbow	32.8	16.8	16.0	32.8	16.8	16.0
Subtotal Drainage Diversions	*78.1*	*16.8*	*61.3*	*78.1*	*16.8*	*61.3*
TOTALS	**693.3**	**332.7(e)**	**189.5 (e)**	**627.1**	**313.8 (f)**	**142.2 (f)**
TOTALS (requiring biological compensation)	421.6			355.4		

Notes
(a) permitted by BLM, prior to listing of the desert tortoise
(b) biological compensation not required; the area was disturbed prior to the listing of desert tortoise as endangered.
(c) additional biological compensation not required; the area was already compensated for in 1992.
(d) Approximately 12 acres was disturbed during permitted exploration drilling in area north of the existing Big Chief Pit; of that, 9 acres are within the proposed pit extension. 45 acres of compensation are pending; however, no permits have been issued regarding pit excavation.
(e) numbers would total 693.3 if the 171.1 acres of Big Chief South and Southeast had not been purposely excluded.
(f) numbers would total 627.1 if the 171.1 acres of Big Chief South and Southeast had not been purposely excluded.



SOURCE: Newmont Mining Corporation, 2000

7/7/00

BRG CONSULTING, INC.

Mesquite Mine Expansion EIR/EIS

Proposed Action

FIGURE 2.1-1

The expansion project includes pit extensions of approximately 51 acres north into Section 5 and 126 acres (101 permitted, 25 unpermitted) on the southeast corner of Section 3 and the northeast corner of Section 10. Additional activities include proposed drainage diversions north of Section 5, and on the eastern extremes of Sections 3 and 10, adjacent to the pit extensions. The heap leach pad in Section 16 is already permitted to be expanded, and approximately 91.6 acres of pad area would be added to existing pads in the eastern part of Section 16. The project also includes construction of ancillary facilities such as access roads, and the relocation of existing ancillary facilities such as the mine office and shops displaced by the proposed Big Chief Pit expansion.

Most storage of subeconomic overburden/interburden (O/I) would be expanded and located at new out-of-pit overburden/ interburden storage areas (OISAs) (See Section 2.1.5.2). The "footprint" of the OISAs would be expanded by approximately 175 acres to accommodate storage of additional waste rock. In-pit overburden/interburden storage would also occur to the extent feasible given current gold prices and the need to protect mineralization (ore) that is presently uneconomical to recover.

2.1.2 The Mining Process

The Mesquite Mine is presently permitted as an open-pit, cyanide heap-leach mine with storage of overburdern/interburden above ground.

2.1.2.1 Open Pit Mining Techniques

The Proposed Action involves the expansion of various components of the currently operating Mesquite Mine. The undertaking does not propose to alter the conventional "open pit" mining and heap leach processing techniques or out-of-pit combined with in-pit overburden/interburden storage practices now in use. This process involves the excavation and processing of ore-bearing rock to extract precious metals. "Ore" is an economic term used to describe a mineral resource that can be profitably mined and processed. The size and configuration of the proposed pits is defined by the precious metals content, depth of mineralization, metallurgy and other geologic, geotechnical and economic factors.

Within the mine site and two north half sections, exploratory drilling was conducted to identify economically recoverable mineral deposits. Drilling results from the OISA and heap areas indicated that no ore reserves were identified in those areas.

Mining of the ore zones would employ conventional open pit mining techniques. Mined O/I would be placed on the OISAs, located adjacent to the pits. As mining progresses, the Big Chief, East Rainbow, and Vista Pits would also be partially backfilled. Figure 2.1-2 shows the projected final configuration and final contours in relation to the topography in the vicinity of the mine. Figure 2.1-2 depicts features to be reclaimed under the "Reduced Footprint Alternative" discussed in more detail in Section 2.2.2. This plan has been shown because it minimizes additional surface disturbance, and reduces project impacts. Thus, it is anticipated to be the preferred action by the Lead Agencies. If the Proposed Action is chosen, the reclamation plan would be identical in concept, but would

comprise an additional 66 acres of mining disturbance at the proposed Big Chief West OISA, East Rainbow North OISA and East Rainbow South OISA.

The overburden thickness above the ore zones is approximately 400 feet thick, and consists mostly of alluvial gravels (both unconsolidated and cemented) and minor amounts of volcanic rock. Ore and some O/I are comprised of weakly-altered gneiss. All of this material is expected to require drilling and blasting prior to excavation.

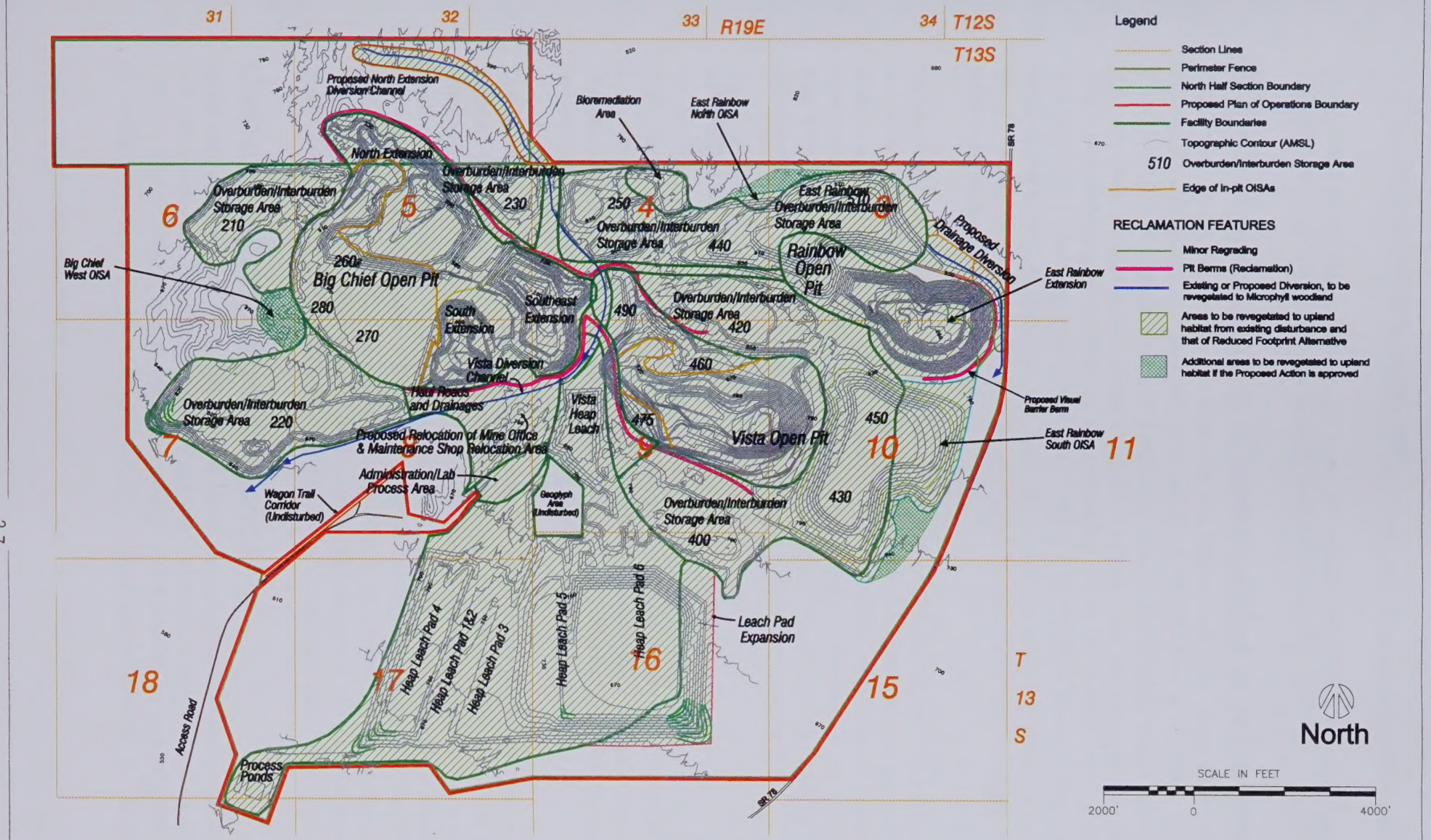
For blasting, mobile rotary blast hole drills would drill 6-3/4-inch to 12-inch diameter blast holes spaced on between 16- and 35-foot centers. The rock would be blasted with a conventional ammonium nitrate/fuel oil (ANFO) blasting agent, although an emulsion blasting agent may be used in the event that water is found in the drill holes. Blasting would occur only during daylight hours. The blasted rock would be loaded, using an electric shovel or diesel front-end loader(s)/shovel(s) into 150-300+-ton capacity haul trucks. No crushing of the ore is proposed, and run-of-mine (ROM) ore would be hauled by the haul trucks directly to the heap leach pad. O/I would also be hauled directly to an OISA. Haulage ramps in the pits have been designed with a minimum width of 120 feet and a maximum gradient of 10 percent. Minor sections of temporary ramping may be steeper and narrower. Haulage roads outside of the pit areas would be 120 feet wide, and in some areas would be 150 feet wide to allow for surface drainage areas and separate lanes for support vehicle traffic.

Haul roads adjacent to the pits may need to be relocated as the mining of the pits proceeds to ensure proper gradients and adequate separation for safety. Also, drilling permits may be sought, and geological surveys may be done in the areas located between the pits.

The ultimate pit walls would have overall slope angles varying from 35 to 45 degrees (1 horizontal to 0.7 vertical [1H:0.7V] to 1H:1V), depending on location of the slope in the pits. Pit wall slopes may be changed slightly as mining conditions, geotechnical and safety factors warrant. Changes would not disturb any lands not analyzed for disturbance in this EIR/EIS or previous environmental documents for the mine.

Piezometer and exploration drill holes drilled to the bottom of the proposed Rainbow Pit Extension have encountered ground water at depths of 528 feet above mean sea level (AMSL), which is above the anticipated floor of the pit. The Big Chief Pit has estimated water levels of 550 feet AMSL. As such, it is possible that groundwater would enter both pits during mining operations. The hydraulic conductivity of the bedrock formation in the mine area is very low, and total ground water inflow has been estimated at only 81.2 gallons per minute. Ground water encountered in the pits during mining operations would be utilized in dust control operations, or collected and used in process operations.

When mining operations have ceased and dewatering of the pits is no longer practiced, ground water inflow would continue, allowing water levels to rise and permanent lakes to develop in the pits. The water levels in each pit lake would rise until, at a certain elevation (called the "near steady-state equilibrium elevation"), evaporative losses from the lake surface would exactly equal ground water inflow. Although pit lake elevations and volumes would not change significantly after near steady-



SOURCE: Newmont Mining Corporation and BRG Consulting, Inc. 2000

7/7/00

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Mesquite Mine Expansion EIR/EIS

Proposed Final Reclamation Configuration

FIGURE 2.1-2

state equilibrium is attained, the concentration of chemical constituents dissolved in the lake waters would increase over time due to the process of evapoconcentration.

2.1.2.2 Geochemical Characteristics of Mined Materials

Some types of O/I, leached ore, or fresh ore can acidify contacting water when exposed to the atmosphere and ground or rainwater. This ability is characterized as a rock's "acid generating potential" (AGP). Generally, rock with a high AGP contains disseminated sulfide minerals, which can react with water and atmospheric oxygen to produce sulfuric acid. The generated acid may then leach metals and other constituents from the waste materials. Other O/I, leached ore, or fresh ore may be acid neutralizing under the same conditions. ANP is a rock's "acid neutralization potential". O/I materials with low acid potential and high neutralizing potential are generally environmentally benign. Additionally, proximity of rocks of high ANP can effectively buffer, or neutralize, acid generated from high AGP materials.

Geochemical characterization analyses were conducted on O/I and leached ore samples from above and below the oxidized zone at the original pits to identify rock types that are potentially capable of generating acidic conditions upon oxidation. The sampling and analyses procedures used to characterize the waste generated from the mine processing, as described in the following sections, were based on procedures generally accepted by the California Regional Water Quality Control Board (CRWQCB), Colorado River Basin Region for characterizing mine waste material.

Static Test Analyses

As part of the ANP analysis, the total sulfur content of each sample was determined to evaluate its AGP. The ANP of each sample was also determined by titrometric methods. The ratio of AGP:ANP is the sample's net neutralization potential (NNP). Based on these analyses performed by the Mesquite Mine metallurgical laboratory between 1992 and 1995, the potential for the Project O/I and spent ore material to be acid generating was found to be low to very low.

During the last two years, additional ANP analyses were performed on representative rock types collected from the Rainbow Pit and from the two north half sections (Sections 5 and 6). The rock types encountered in the Rainbow and two north half sections are typically net neutralizing with positive NNP values. However, it should be noted that only the Jurassic Mafic Gneiss (MG) rock type encountered in the Rainbow Pit is clearly net neutralizing according to the definition of NNP> 20 tons carbonate ($CaCO_3$) per kiloton rock, whereas the other gneissic materials from both locations fall within the NNP range of 0-20 tons $CaCO_3$ per kiloton of rock, and therefore, exhibit greater uncertainty in their neutralizing capacity (Baker Consultants, Inc., 1999).

Geochemical Characteristics

Metal analyses, using total metal and acidic rain water extraction methodologies (the latter using the U.S. Environmental Protection Agency (USEPA) Synthetic Precipitation Leaching Procedure (SPLP) (Method 1312)), were conducted on samples of O/I and ore material. The SPLP is designed to simulate the concentrations of metals and other compounds which could be leached from waste

materials exposed to naturally acidic rainfall. Ore samples were first subjected to leaching by dilute cyanide solution to remove precious metals, then neutralized to be representative of the leached ore material, which would remain on the heaps following completion of Project activities. The results were compared to U.S. EPA drinking water maximum concentration levels (MCLs) (Shepherd Miller, 1998).

The pH values of the SPLP extracts ranged from near-neutral (6.76) to moderately alkaline (9.11). Total dissolved solids (TDS) concentrations ranged from 41 to 271 mg/L, sulfate concentrations ranged from <1 to 90 mg/L, and chloride concentrations ranged from <1 to 43 mg/L. Most constituent concentrations were below MCLs. However, pH values of nine of the 19 samples were above the secondary MCL of 8.5, and eight samples had aluminum concentrations above the upper range of the secondary MCL of 0.2 mg/L (all rock types had one or more sample with elevated pH values and aluminum concentrations). Three samples had arsenic concentrations above the primary MCL of 0.05 mg/L.

2.1.2.3 Ore Processing Facilities

Ore at the Mesquite Mine is processed using conventional heap leach methods. Other mines in Imperial County and throughout the western United States have successfully utilized heap leach methods for several decades. The process involves stacking the ore on an engineered, synthetically-lined, impervious pad. The surface of the ore heap is then wetted with an alkaline solution containing low concentrations of sodium cyanide. This solution percolates through the ore, producing a soluble, precious metal-cyanide complex known as the "pregnant" solution. The pregnant solution drains downward through the heap to the pad liner, then flows along the liner within a pipe drainage system to the process solution ponds. The gold/silver-bearing pregnant solution is then pumped from the process solution pond to the processing facility where the precious metals are extracted from the solution via a carbon adsorption process. The resultant "barren" solution, from which the gold/silver has been removed, then is reapplied to the heap leach. Additional makeup of water and sodium cyanide is added as necessary.

In the refining process, the carbon from the adsorption process is first stripped of its gold/silver by a stripping solution from which the gold/silver is then electroplated onto steel wool or stainless steel cathodes. The electroplated gold is then remelted and cast into bars for transport.

2.1.2.4 Vadose Zone and Ground Water Monitoring

Compliance monitoring is performed pursuant to California Regional Water Quality Control Board (RWQCB) Monitoring and Reporting Program (Revision No. 1) No. 95-016 (MRP). Twenty-two vadose monitoring wells drilled 20 to 100 feet below grade are installed peripheral to the leach pads and the solution pads. A vadose (the unsaturated zone above the water table) zone monitoring system is used to sample gas for hydrogen cyanide (HCN) adjacent to and underneath the leach pad and process sites. Every quarter, an additional nine vadose wells are used to sample for cyanide solution. Seven ground water monitoring wells (depth approximately 300-350 feet) are used to monitor ground water quality at the site. The wells are equipped with electric submersible pumps for

purging and quarterly ground water sampling for the primary monitoring parameters: total cyanide, free cyanide, total dissolved solids, gold, silver, copper, iron, arsenic, sulfate and nitrate. The field parameters including temperature, specific conductance, pH, turbidity and water depth are also measured quarterly at each well. To date, all samples have been in compliance with the RWQCB permit.

2.1.3 Support Facilities

The Mesquite Mine expansion would rely on the existing mine's support facilities that include: office buildings; maintenance shop on a reinforced concrete slab; telephone facilities, including a microwave communications antenna; explosives magazines; an ammonium nitrate storage facility; a lime storage facility; chemical storage areas; diesel fuel storage areas; water storage facilities; an electrical substation and electrical distribution power lines; emergency electrical power generators; a temporary hazardous waste storage area; equipment wash facilities; a laboratory; roads; and surface flow and erosion control structures. Off-site support facilities include: existing water supply wells and connecting pipeline, and electrical power lines.

2.1.4 Proposed Facilities

The following information is summarized from the Plan of Operations for the Proposed Mesquite Mine Expansion (Newmont Gold Company, 1998 and 1999). The earlier document addressed a Plan from which the Proposed Action was derived, while the later document addressed a Plan that has been call the Reduced Footprint Alternative in this EIR/EIS.

The proposed Mesquite Mine Expansion consists of the following currently permitted and unpermitted expansions:

- Extensions of the Big Chief Open Pit Mine
- Extension of the Rainbow Open Pit Mine
- Expansion of Out-of-Pit Overburden/Interburden Storage Areas (OISAs)
- Construction of ancillary facilities such as access roads and storm water diversion channels
- Expansion of Heap Leach Pad 6

Disposition of subeconomic O/I in a combination of OISAs and in-pit storage is proposed. The mine expansion would also use the currently permitted Section 16 heap leach pad expansion described in Section 2.2.3.1. The Proposed Action includes an application to RWQCB for expansion of the Section 16 heap leach pad from 200 feet to 300 feet in height.

2.1.4.1 Open Pits

The identified ore reserves occur approximately 250-430 feet beneath the existing ground surface. The existing Mesquite Mine is permitted for open pit mining to access ore reserves. Open pits are created by drilling, placement of explosive charges, blasting, loading blasted material into large 150-300+-ton haul trucks, and hauling O/I to the OISAs, or hauling ore to the heap leach facility.

Rainbow Open Pit Mine Extension

The existing Rainbow Open Pit Mine would be extended to the southeast. The extension would allow access to approximately 23 million tons of ore and would occupy approximately 126 acres. This extension would only require 25 acres of unpermitted disturbance because 101 acres of the 126-acre footprint was previously permitted for disturbance (See Figure 2.1-2). Approximately 71 million tons of O/I from the extension would be produced. This material would be stored in an OISA.

The maximum depth of the proposed pit extension is approximately 570 feet. The east wall of the expanded pit would have a designed inter-ramp slope angle of 43 degrees and would be set back from Highway 78, as recommended by a professional engineer, in order to provide adequate geotechnical stability. An O/I buttress constructed at the toe of the eastern pit wall would be considered as an option if needed to provide additional pit wall stability adjacent to the highway corridor.

Additionally, a berm would be constructed on the eastern edge of the proposed extension to help direct stormwater and to reduce visual impacts to Highway 78 traffic. The berm would be a minimum of 10 feet in height with 2:1 side slopes and would extend approximately 2,450 feet.

Big Chief Open Pit Mine – North Extension

The extension of the existing Big Chief Open Pit Mine toward the north would extend into the northern half of Section 5 of T13S, R19E. The proposed extension would allow access to approximately 8 million tons of ore and would occupy approximately 51 acres of new, unpermitted disturbance.

Approximately 20 million tons of O/I would be removed from the proposed extension. This material would be stored in an OISA.

Big Chief Open Pit Mine – South and Southeast Extension

An extension of the existing pit is proposed toward the south and southeast in Sections 4, 5, 8 and 9 of T13S, R19E. The proposed pit extension would allow access to approximately 25 million tons of ore and would occupy approximately 171 acres. These 171 acres are currently disturbed by the presence of support/ancillary facilities such as haul roads, shops and a portion of the Vista Heap Leach Pad. Approximately 24 million tons of O/I would be removed from the proposed extension. This material would be stored in an OISA.

2.1.4.2 Vista Heap Leach Pad – Rinsing, Closure and Partial Removal

Approximately 6,000,000 tons of spent leach ore is currently under the final phase of leaching on Vista Pad. Following completion of rinsing, formal closure and State of California approvals, the rinsed ore would either be removed and stored in an IOISA in the existing Vista Open Pit Mine, or would be relocated to a lined heap leach facility (Pad 6) if rinsing is not successfully completed. The

truncated northern limit of the Vista Heap Leach facility would then be rebuilt to provide a containment berm and solution channel similar to the existing facility.

Applicable RWQCB detoxification standards for cyanide and for metals (mining waste Class "C") that Mesquite Mine must meet are contained in RWQCB Order No. 95-016. It is anticipated that no more than 1 pore volume of water, obtained from the existing well field, would be required to rinse the heap leach materials to meet RWQCB standards. The nearby Picacho Mine, which has similar ore properties, met the same standards using only 0.5 pore volume of rinse water.

While no pads are likely to be ready for rinsing prior to start of the expansion, it is expected that rinsing of the Vista Pad will be completed in the near future. This area could serve as a demonstration for the amount of water needed for rinsing to meet applicable detoxification standards. It must be noted here that release of any bond is dependent on RWQCB review and approval of the results of the detoxification process. If, through unusual conditions, more rinse water is required than has been anticipated, Newmont Mining Corporation would cooperate in revisiting the bond calculations to re-establish an appropriate bond.

2.1.4.3 Overburden/Interburden Storage Areas

The proposed mine plan would generate approximately 242 million tons of O/I. Final disposition of these materials from the various proposed pit extensions would be via expanded OISAs and/or discretionary backfilling into existing pits. These OISAs include the proposed Big Chief West OISA, East Rainbow North OISA and East Rainbow South OISA (Figure 2.1-1). Table 2.1-2 depicts the presently unpermitted land disturbance necessary for the proposed OISAs.

The previously approved East Rainbow North OISA would have a capacity of approximately 82 million tons and would be expanded by 22 acres, which have been previously approved for surface disturbance. The proposed East Rainbow South OISA would have a capacity of approximately 120 million tons and would occupy approximately 132 acres. Approximately 99 of the 132 acres have been previously approved for surface disturbance. Approximately 33 acres of new (not previously approved) disturbance would occur. The proposed Big Chief West OISA would occupy approximately 21.2 acres, of which 2.6 acres already have permits for disturbance, and 18.6 acres would require new permits.

The Proposed Action would include some in-pit storage of O/I, estimated at approximately 12.5 million tons. Newmont proposes to consider additional in-pit storage in the future as economic conditions allow.

2.1.4.4 Storm Water Diversion Channels

All surface drainages in the area are ephemeral, with flows occurring only during, and immediately following, major precipitation events. It is necessary to convey storm water around project facilities to allow for continuing operations and to ensure long-term stability of the resulting pit walls, OISAs and heaps. The proposed drainage diversions would permanently route three washes (identified as

Table 2.1-2

Proposed OISA Expansions

Proposed OISA	O/I Capacity (Tons)*	Height (Fee)**	Unpermitted Private Land Disturbance (Acres)	Acres of New Unpermitted Federal Land Disturbance
East Rainbow South	119,731,000	300	0	33
East Rainbow North	81,720,000	300	0	0
Big Chief West	42,921,000	300	0	19
TOTAL	**244,372,000**		**0**	**52**

Notes: * Tonnages are rounded up to the nearest thousand. The storage of O/I would also include some backfilling of existing pits.

** OISA heights of 300 feet were previously approved under existing permit conditions.

Source: Newmont Gold Company, 1999

the East Rainbow Pit Diversion Channel, Big Chief Open Pit North Extension Diversion Channel, and the Vista Diversion Channel) around the mine pits. In each case, all drainage diversions would channel surface flows either back into the same drainage channel, or into another existing nearby drainage channel, which eventually flows back into the original drainage channel (See Figure 2.1-2).

Based on the existing U.S. G.S. topographic map of the area, and the locations of proposed diversions, channel slopes of the existing washes were compared to the proposed diversion channel slopes. The four major washes upstream from the North Diversion have slopes ranging from 1.8 to 2.4 percent. The slope of the proposed North Diversion is 0.5 percent (per Hanson, April 1998). Below the diversion channel, the natural washes have slopes of 1.2 to 1.4 percent. The East Rainbow Diversion has a proposed slope of 0.8 percent. The two major washes upstream from it have slopes of 2.1 and 2.2 percent. Below the diversion, the natural washes decrease in slope to 1.8 and 1.9 percent.

The diversion channel berm would be armored with rip-rap at the transition where the natural washes intersect with it, to minimize erosion. The decreased slope in the diversion channel would serve to slow down the rate of water flow. Flow rates would increase when the diversion delivers the water to the natural channel downstream. Peak flows for the North Diversion and the East Rainbow Diversion under a 100-year – 6-hour storm event are projected to reach 2,330 and 300 cfs, respectively (Hanson, April, 1998).

East Rainbow Pit Diversion Channel

Approximately 33 acres would be required for the construction and ancillary disturbance associated with the proposed storm water diversion around the northern and eastern perimeter of the proposed East Rainbow Pit Mine extension. Approximately 17 of the 33 acres have been previously approved for surface disturbance. This diversion would also require approximately 16 acres of new (not previously approved) disturbance.

An earthen berm would be constructed on the southern/western sides of the diversion channel to direct flow. The berm would be armored pursuant to the Engineer's design. Channel grade would be approximately 0.5 to 1.0 percent over the entire channel length. Storm water flows leaving the channel would return to existing washes to the southeast of the project site and would not affect either project components or Highway 78.

Big Chief Open Pit – North Extension Diversion Channel

Approximately 51 acres of new (not previously approved) disturbance in Section 5 of T13S, R19E would be required to construct a surface-water diversion channel along the northern perimeter of the proposed Big Chief Open Pit Mine extension. The proposed channel, referred to as the North Extension Diversion Channel, would divert storm water flows around the northern boundary of the pit. An earthen berm would be constructed on the south/west sides of the diversion channel to direct flow. The berm would be armored pursuant to the Engineer's design. Channel grade would be approximately 0.5 to 1.0 percent over the entire channel length. Storm water entering the channel

would then be conveyed southward through the site by the proposed Vista Diversion Channel (discussed below), and then to portions of the existing engineered drainage. Ultimately, flows would leave the site via the existing drains in Sections 7 and 8 in T13S, R19E, return to existing washes, and drain away from the site.

Vista Diversion Channel

Mining of the South and Southeast Extensions of the Big Chief Open Pit Mine would occur within the previously realigned drainage in the northeast corner of Section 8, T13S, R19E. A new channel, the Vista Diversion, is proposed to carry storm water flows emanating from north of the north extension of the Big Chief Open Pit Mine. This channel would be approximately located in its historic, pre-Mesquite Mine, location. The channel would be excavated in existing disturbed areas in native alluvium and would be armored pursuant to the Engineer's design. Channel grade would be approximately 0.5 to 1.0 percent over the entire channel length. Ultimately, flows would leave the site via the existing drains in Sections 7 and 8 in T13S, R19E, return to existing washes, and drain away from the site.

2.1.4.5 Heap Leach Pad 6 Expansion

This facility would be expanded to the east, under existing permits, to accommodate approximately 89,000,000 tons of ore and would add 2,250,000 square feet of lined area. This expansion would not be constructed until final design of the facility has been approved by the RWQCB. Following completion of rinsing, formal closure and State of California approvals, approximately 6,000,000 tons of spent leach ore from the Vista Heap Leach Pad would either be relocated to Pad 6, or would be removed and stored in an OISA. Final height of Pad 6 would not exceed 300 feet, and the pad would be constructed in lifts of approximately 30 feet. The new phase of the leach pad would be connected to existing Pad 6 drainage and solution collection system. No additional pond or major piping modifications are required to accommodate the new facility. Permit-mandated levels of pond freeboard and stormwater collection capacity would be maintained. Total new disturbance (already permitted and compensated for) would be approximately 91.6 acres. Section 16 is presently permitted for an expansion of Leach Pad 6 to include the entire section, with a maximum height of 300 feet. However, the proposed height increase to 300 feet is not yet approved.

It is anticipated that liner system construction activities would occur every two to four years for the Proposed Action. As part of the permitted leach pad construction, the site to be constructed would be graded to ensure solution drainage from the leach pad to the solution ponds. In addition, the heap benches and berms would be constructed to provide for 100 percent containment of the precipitation from the one-hour probable maximum precipitation (PMP) design storm event. A service road and containment berm would be constructed around the perimeter of the pad to ensure that process solution and rain, which falls onto the heap, drains to the pregnant solution pond. Interceptor ditches would be constructed to divert upstream surface runoff around the heap leach facilities.

The heap leach pad liner would be designed to serve as an engineered alternative to the prescriptive standard for a Group B mining waste, waste pile, as contained in Title 27, Division 2, Subdivision 1,

Article 7 of the CCR (formerly Title 23, Division 3, Chapter 15, Article 7), and may be approved, or modified, by the Regional Water Quality Control Board (RWQCB) in the Waste Discharge Requirements (WDRs) for the Project. It is anticipated that the liner would be designed to comply with Region 7 RWQCB Order No. 95-016. Liners that have previously been approved by the RWQCB at Mesquite Mine consisted of a PVC geomembrane liner and two layers of compacted, low permeability clay materials, placed on several inches of compacted, fine-grained bedding materials. Third-party construction quality assurance/quality control (QA/QC) would be provided to ensure that lining and bedding materials and containment facilities were constructed in accordance with design specifications approved by the RWQCB. Third-party QA/QC reports would be sent to RWQCB as they are completed.

The existing liners have proven adequate since their first installation in 1984. There has been no detection of cyanide in either the vadose zone or in underlying groundwater, as documented in semiannual reports to the RWQCB.

A containment berm would be constructed around the perimeter of the ore heap. The ore heap would typically be set back from the inside crest of the berm. The leach pad system would be designed such that pregnant solution would drain internally to the central pipe network and into the pregnant solution pond. No exposed solution ditches would be present. A containment berm for the 24-inch solution pipes would be installed along the downhill toe of the leach pad. Containment berms and other higher-sloped areas would be constructed utilizing compacted, fine-grained bedding material.

The first lift of run-of-mine ore would be loaded onto the heap leach pad directly over the protective layer of free-draining gravel. The ore would be loaded onto the pad, without prior crushing, by end-dumping from the haul trucks. Approximately two pounds of lime per ton of ore would be placed onto the trucks prior to dumping. The ore would be spread and scarified by a bulldozer to produce a heap pile with relatively uniform thickness and percolation characteristics.

2.1.4.6 Infrastructure

Extension of the Big Chief Open Pit Mine would require relocation of the existing mine-site operations office, maintenance shop, and ancillary features. These facilities would be disassembled and reconstructed in a previously disturbed area in Section 8, west of the Vista Heap Leach Pad. The specific location is shown in Figure 2.1-1. The existing concrete slab under the offices and shop would be demolished and buried in the OISAs.

Construction of facilities in addition to those listed above would not be required. Existing and approved facilities would be utilized for the proposed expansion operations. Existing ancillary facilities include ore stockpiles, carbon column/electro-winning process area, metallurgical laboratory, change house, explosives magazine, electrical substation, water supply system, fuel storage tanks, lime silos, haul roads, exploration roads and pads, access road, and parking facilities.

A six-foot high chain link fence topped with concertina wire currently surrounds most of the site. Fencing on the north side of the project does not include concertina wire, and is not continuous. In those areas, natural topographic barriers inhibit access to the site. All proposed expansion areas would be fenced where necessary for security and to avoid unauthorized entry.

2.1.4.7 Proposed Disturbance Areas

Table 2.1-3 summarizes the existing and total new mine area disturbance under the Proposed Action for the Mesquite Mine Expansion. The proposed expansion would result in a total allowable disturbance of approximately 5,151 acres. Of this total disturbance, 4,962 acres of disturbance has been previously approved, and a total of 189 acres (see Table 2.1-1), of new disturbance to public lands is proposed under the Plan of Operations. The reallocation of a total of 228 acres of previously approved surface disturbance is also proposed under the Plan of Operations. Table 2.1-3 provides a list of facility categories and the new total allowed disturbance that would result from the Proposed Action.

2.1.5 Water Availability, Sanitation and Utilities

Primary water use at the proposed mine expansion would include the following:

- Dust control
- Soil compaction
- Equipment and facilities maintenance
- Processing (leaching, etc.)
- Sanitation

The Applicant proposes to obtain water from the existing Mesquite Mine Well Field located approximately three miles to the south of the existing site. Initial calculations, based on recent water use records, indicate that the Mesquite Mine water use would not exceed the existing maximum permitted annual well field withdrawal rate of 4,033 acre-feet per year. The Mine used 1,500 acre-feet of water in 1997, but only 1,187 acre-feet in 1999, as measured by the flow meter at the well field.

Sanitation is to be handled by existing Mesquite Mine facilities, utilizing septic tanks. The septic tanks are pumped and maintained periodically to keep the system biologically active and in good working condition. Pumped materials are transported off-site to an appropriate disposal facility. Electricity would be the primary source of power for non-vehicular operations. The primary electrical use would be for pumping of water. Other operations and maintenance facilities would require reduced amounts of electricity.

Table 2.1-3

Proposed Total Allowable Disturbance, Proposed Action

Facility	Cumulative Allowable Disturbance(a)	Existing Disturb-ance	Additional Pro-posed Disturb-ance (Public)	Reallocation Of Disturb-ance Type(b)	Total Allowable Disturbance
Open Pits	968	762	76	+228	1,272
Heap Leach Pads	1,145	903	0	-30	1,115
OISAs	1,690	1,219	52	-74	1,668
Ancill. Facilities	1,159	771	61	-124	1,096
TOTAL	**4,962**	**3,655**	**189**	**0**	**5,151**

Notes: Assumes that OISAs are employed rather than in-pit storage to show maximum possible disturbance. Totals were calculated as if all allowable disturbance occurs. Existing clay storage has been included under existing OISA disturbance.

(a) Allowed under existing approvals (Consolidated POO).

(b) Proposed reallocation of 228 acres that are now approved for disturbance as heap leach pads, OISAs, or ancillary facilities are to be made available for open pit disturbance. No new disturbance is proposed in this column, as may be verified by the zero in the last row. The reallocation is proposed to provide design flexibility in proposed south and southeastern expansion of the Big Chief Pit. These changes accommodate proposed use of 30 acres previously disturbed- by the Vista Heap Leach Pad, and other areas currently permitted for OISA and ancillary facilities disturbance.

Source: Newmont Gold Company, 1999

2.1.6 Proposed Mining Schedule

The Mesquite Mine is a fully-permitted, operating mine. Current ore reserves included in the Mesquite Consolidated POO will be depleted no later than the first half of the year 2001. Construction on the proposed expansion is anticipated to begin in the year 2001, following the approval of the Proposed Action and other required permits. Approval of the proposed expansion during the year 2000 would allow continuous operations, without process interruption, facility closure, or staff reductions. The proposed expansion could extend mine operations for approximately six years (tentatively through the year 2006) or longer depending on economics. Mine reclamation has already begun, and would end in 2011 or when success criteria are met.

Mining rates would vary with time and would begin at approximately 51 million tons of material in year one (2001). The rate would then be increased to approximately 55 million tons in years two to four (2002-2004); and approximately 58 million tons in year five (2005), and 56 million tons the final year of mining operations (year six or 2006). At no time would mining rates exceed the currently permitted 60 million tons per year. Table 2.1-4 indicates the total volumes of materials to be mined, by year, after receipt of the final project approvals.

2.1.7 Reclamation

The Reclamation Plan for the proposed expansion is found in Appendix B of the POO, which was revised as of November 1999. Details of reclamation activities such as recontouring, revegetation and facility demolition are provided in that document. The Mesquite Mine has an approved Reclamation Plan for existing facilities in compliance with the 43 CFR 3809, Surface Mining and Reclamation Act (SMARA) and County Regulations. As the site is located in a remote area and involves some public lands, the reclamation objective is to return the site to open space and wildlife habitat while providing for future mining opportunities that could exist.

Newmont Mining Corporation proposes to conduct reclamation activities for the proposed expansion in accordance with SMARA and the federal regulations found at 43 CFR 3809, the BLM solid minerals reclamation handbook, H-3042-1 and State regulations 14 CCR 3500. The reclamation plan addresses all surface disturbance created by the project. In general, the proposed Reclamation Plan includes measures for protecting wildlife and the public; minimizing erosion and mass failure potential; demolishing structures and neutralizing process components; regrading of selected side and cut-and-fill slopes; revegetation; and, where feasible, providing for the resumption of pre-mining land uses.

Newmont's stated post-mining reclamation goals of the project are to establish conditions that would:

1. Promote the long-term development of a vegetation community typical of the local area;

2. Produce reclaimed areas that are visually and functionally compatible; and

Table 2.1-4

Proposed Mesquite Mine Material Movement Schedule*

Year**	Ore (tons)	Overburden/ Interburden (tons)	Total (tons)
1- (2001)	93,523	51,120,732	51,214,255
2- (2002)	9,538,123	44,820,500	54,358,623
3- (2003)	20,005,942	35,341,384	55,347,326
4- (2004)	11,835,646	43,226,016	55,061,662
5- (2005)	22,162,586	36,009,207	58,171,793
6- (2006)	25,000,000	31,372,564	56,372,564
TOTAL	88,635,820***	241,890,403***	330,526,222***

Notes:
* Includes rehandling of approximately 7,000,000 tons of material from the Vista Pad and existing OISAs.
**Mining may begin earlier depending on approvals.
***Includes mining in areas of existing and already permitted disturbance.

Source: Newmont Gold Company, 1999.

3. Reclaim the area to a stable, functioning landscape unit/ecosystem to allow for similar, but not identical, land uses as currently exist. This would include wildlife habitat and recreation consistent with the applicable reclamation standards of the California Code of Regulations, Article 9, Title 14 (Reclamation Standards), and the surface management regulations under CFR Title 43, Group 3800.

The final landforms cannot be reclaimed to the original contours. The goal of the plan is to create and enhance a self-supporting desert ecosystem that would provide for the post-mine land use of open space for purposes of wildlife habitat, mineral exploration, and recreation. The plan's objectives are as follows:

1. Establishment of stable surfaces and drainage conditions that are compatible with the surrounding landscape;
2. Creation of surface and substrate conditions conducive to plant establishment, where possible;
3. Enhancement of natural reproduction through soil scarification and microcontouring;
4. Management of surface water runoff with microcatchments
5. Use of native plant seeds and materials from local sources within a 10-mile radius of the project site, to ensure site adaptability of the seed; and
6. Blending of the side slopes with the surrounding hillsides in specific areas identified in this plan.

Reclamation demonstration plots comprising 600 acres have been established on Mesquite Mine OISAs. These lands have been recontoured, and more than 500 acres of the test plots have been seeded with native seeds. The plots serve the purposes of training equipment operators in grading methods used for revegetation, in establishing time and equipment use standards for reclamation planning and cost estimation, and for documentation of activities for tracking and reporting progress. Additional details about the test plots are provided in Attachment 1 of the 1999 POO. These demonstration plots, and the studies conducted by the University of Arizona, provide some of the information upon which the proposed Reclamation Plan has been developed.

The reclamation effort consists of different methods to be applied, as appropriate, to reclaim different types of surface disturbance. These methods are the construction and reclamation of diversion channels; demolition of structures and removal of facilities; rinsing and neutralization of residual leach solution in the solution ponds and heap; design and construction of stable slopes; rough regrading; surface preparation through fine grading, ripping to loosen soil, topsoiling and/or construction of water catchments for vegetation; tree and cactus transplantation; reseeding and revegetation with only species indigenous to the area.

The reclamation approach utilizes surface recontouring, combined with seeding of plant species native to this desert region. Proposed final topographic contours are shown in Figure 2.1-2. Plant establishment will occur primarily in conjunction with creation of moisture-enhancement structures (microcatchments) that would serve to collect and concentrate natural precipitation in small basins.

Baseline vegetation conditions for the mine expansion areas are described in Section 3.3 of this EIR/EIS, and in the Vegetation Baseline Survey, Mesquite Mine Project (2000), prepared by Samuel Bamberg and Ingrid Hanne. The latter document is included as Appendix B to this EIR/EIS. Bamberg and Hanne distinguished four categories of shrub/scrub vegetation, covering 90 percent of the study area, and three categories of tree/shrub vegetation (based on the size of the desert wash in which they were found). Perennial shrubs are the dominant vegetation, with trees and a few herbaceous perennials found along the washes. The dominant shrub species, in order of abundance, are *Encelia farinosa* (inciensio), *Ambrosia dumosa* (burrobush), *Larrea tridentata* (creosote bush), and *Opuntia bigelovii* (teddy-bear cholla). The most common tree species were Olneya tesota (desert ironwood) and Cercidium floridum (blue palo verde), found along the washes at relatively low densities.

Perennial plant densities within the proposed mine expansion areas ranged from 0 plants per acre in areas of desert pavement, up to 1,655 plants per acre in areas of shallow washes. The 10 percent of the study area containing tree/shrub vegetation contained an average of 1,055 plants per acre, while shrub/scrub vegetation areas averaged 164 plants per acre (75 percent of the study area). The remaining 15 percent had little or no plant cover, due to disturbance from roads or other soil disruption.

Revegetation would be undertaken for all areas that either have been, or are proposed to be, disturbed by mining activity. This includes all areas that contain diagonal hatching in Figure 2.1-2, plus the areas of proposed mine expansion shown in color on Figure 2.1-1. Because of the physical variance between the different portions of the disturbed area, three revegetation approaches are proposed. One approach would focus on revegetating approximately 5 miles of existing and proposed diversion channels, with an emphasis on reestablishment of microphyll woodland species. A second approach would be used to revegetate existing and proposed OISAs, heap leach pads, and ancillary facilities using upland habitat species. A third approach addresses revegetation of the open pits.

Diversion channels would be designed to pass the storm events which they must accommodate, per applicable law and regulations. Proposed channel designs have been submitted for review by Imperial County, the California Office of Mine Reclamation, and the California Department of Transportation. Where possible, the channel would be constructed with natural-appearing curves, benches and banks (see POO Figure B.13). The proposed bench would not be compacted. Existing diversion structures have volunteer microphyll species plants growing there; the newly designed diversions would offer even better habitat. Surfaces of the banks and benches would be regraded with microcatchment depressions to capture and concentrate available water. Topsoil salvaged from similar habitats within mine expansion areas would be utilized in preparing the benches and lower banks for subsequent seeding using a locally-gathered seed mix. Microphyll species "tubelings" would also be planted along diversion channel benches.

Revegetation of OISAs, heap leach pads, and ancillary facilities/areas would follow minor regrading of portions of the heap leach pads, and rounding of contours at some corners of the OISAs. Microcatchments, essentially grooves or depressions in the area surface, would be formed to capture local precipitation, to enhance plant survival. Such microcatchments would range in length from 5

to 50 feet, and from one to 15 feet wide. This approach has been found to be successful in reclamation of the nearby American Girl Mine. Soil surfaces then would be scarified or ripped to a depth of 15-18 inches in order to capture native seeds to be sown.

Some portions of the open pits have been/would be utilized for O/I storage (see Figure 2.1-2). Such areas would be reclaimed and revegetated as described above. Haul roads and accessible portions of pits not adjacent to pit lakes would also be ripped, and graded into microcatchment areas. These graded areas would then be seeded with the locally-collected seed mix.

Little topsoil exists in the portions of the expansion areas characterized by desert pavement or upland succulent vegetation. These areas have strongly saline subsoils, alkali conditions, and gravelly or rocky textures. They are not suitable as a growth medium or seed source for reclamation. Where there is suitable topsoil, such as in microphyll woodland areas, that topsoil would be collected and used. Areas of suitable topsoil within the proposed expansion areas have been mapped (see Figures 4-5 through 4-7 in the Vegetation Baseline Survey, Appendix B). These areas were estimated to contain approximately 18,000 cubic yards of suitable topsoil. No stockpiling of topsoil is anticipated. Rather, it would be placed as needed as mine development proceeds at, first, the new diversion channels and then, if any is left, OISAs and heap leach pads. If topsoil stockpiles are needed, they would be protected from wind erosion by placing them on the lee side of existing waste rock areas, with signs identifying the material and its planned use to preclude inadvertent use for other purposes.

If plants suitable for transplantation are encountered and must be disturbed during mining activities, they would also be used for revegetation purposes. Such plants are anticipated to include small ironwood and palo verde trees having trunk diameters of 2 inches or less; barrel cactus and chollas of various sizes; small ocotillos, and other shrubs. However, the primary emphasis would be on growth of native plant materials from seed. Transplantation would be done during the late fall or early winter to increase plant survival chances, and would involve healthy plants with healthy root systems. Old growth and unhealthy stems would be pruned, and the plants would be moved within 6 hours to holes dug in microcatchment basins or other depressions. Transplanted plants would be watered twice in three hours, then again in three days. Transplanted trees would be watered periodically for up to two years, but other plants would not require additional watering unless it does not rain for six months.

The area disturbed by mining activity would be revegetated using native or naturalized plant species seeds gathered from within ten miles of the mine. A list of the specific plant species from which seeds would be obtained is found in the POO, Table B-3. Such plants have shown themselves to be able to withstand the harsh conditions present at the mine site.

In the seed collecting programs that have been implemented, seeds have been collected in three ways: 1) directly from the plants; 2) from seed accumulations below shrubs and wind rowed in washes and depressions; and 3) seed banks from salvaged soil. All three methods have been, and would continue to be used to provide seeds for Mesquite Mine revegetation. However, methods two and three have

the advantages of providing large volumes of seeds; seed collection can be done at any time after a productive year, and stored; a wide variety of seeds can be collected; and the litter and soil materials collected with seeds from the ground contain useful nutrients, spores and other soil organisms. See Bamberg responses to comments on EIS Reclamation Plan, 3/31/2000

The seeds would be distributed either by aerial application, or hand broadcast methods (for isolated areas that are less than 10 acres in size). Seed application rates are based on recent experience with 500 acres of on-site demonstration plots (see Attachment 1 of the POO). Seed application rates are expected to range from 2 to 10 pounds of seed per acre, with an average of approximately five pounds per acre.

Seeds would be scattered immediately following scarification of each successive area and creation of microcatchments. This would typically be done in the late spring or early fall, to take advantage of the winter rains. For any fairy duster (*Calliandra*) plants that are destroyed by the proposed mine expansion, replacement plants may be germinated in tubes from collected seed. When ready, they would be transplanted to locations matching their native habitat, along shallow washes within the mine boundaries. It is anticipated that transplantation would be done in early winter, to take advantage of the winter rains.

Fences would be used to preclude grazing or trampling of the new vegetation; however, it is impossible to keep deer and rabbits out. Revegetation at American Girl and Picacho mines, using a similar revegetation approach, has proven successful.

No supplemental irrigation of the seeded areas is proposed. Irrigation was tested in studies conducted by the University of Arizona's Office of Arid Lands Studies (1988-1994), but it was found too detrimental to be used because it facilitated growth of exotic, invasive weedy species.

Dr. Bamberg has monitored composition and densities of all plant species during revegetation testing programs and reclamation implementation at area mines for the last ten years. Based on his experience, and the proposed revegetation approach that uses no supplemental irrigation, no significant problem with invasive, exotic plant species is anticipated. This is because the majority of plants that germinate and grow in the revegetated mine areas are native species adapted to heat, dry climate and low soil moisture. No exotic shrubs or trees are able to grow in this desert without artificial maintenance of moisture conditions. The single exception is tamarisk, which may persist for a short time in ditches along watered roads, or at the base of heap leach pads with high soil moisture. Once the added soil moisture ceases, the tamarisk tree cannot survive the desert conditions. Selective spraying of tamarisk with an approved herbicide such as "Roundup" or "Garlon" would be considered, if necessary, subject to BLM approval. In mine areas that have been reclaimed, no other non-native perennial plants have been recorded. Other exotic species such as red brome, and Mediterranean grass cannot out-compete the native species in areas that are not periodically disturbed. A few mustard species, such as *Malcolmia africana*, were recorded at low densities and at less than one percent cover of the annual flora in mine revegetated areas. Reclaimed

areas that utilize the proposed revegetation approach have been found to be stable and self-sustaining without additional weed control or maintenance after grading and seeding.

The proposed revegetation success criteria are based on achieving a plant establishment that is at least 25 percent of the natural plant density and diversity formerly present in that terrain type. The 25 percent density criterion has been accepted by the BLM in their approval of several recent mine reclamation plans in the vicinity. Appendix B to this EIR/EIS identifies terrain types present in each proposed mine disturbance area, maps their boundaries, calculates their areas, and determines their existing plant densities and diversity. Table B.5 on page B-36 of the POO displays the plant density criteria that would determine revegetation success, for each vegetation subcategory. These densities range from 0 plants per acre for desert pavement, through upland at 55 plants per acre, up to 414 plants per acre for shallow washes. Plant diversity criteria would be based on the vegetation baseline report information.

2.1.8 Compliance Monitoring

The various permits for operation of the proposed mine expansion stipulate numerous monitoring and reporting requirements. A mitigation, monitoring, and reporting program (MMRP) will be developed for the proposed Mesquite Mine Expansion according to the requirements of Public Resources Code 21081.6 and CEQA Guidelines 15097. The MMRP will be prepared concurrently with the Mesquite Mine Expansion Final EIR/EIS and would be docketed for EIR/EIS consideration by the Imperial County Planning Commission, Board of Supervisors and the public. Proposed mitigation measures are listed in this EIR/EIS under each environmental topic, and in the executive summary. Monitoring would be performed by full-time monitoring and engineering personnel who would be employed by the Applicant and would be subject to independent verification by permitting agencies.

BLM would monitor and enforce revegetation efforts for at least five years or until revegetation success criteria have been met. Revegetation efforts would be monitored on an annual basis, and reports would be prepared each year that document how well those efforts are proceeding to meet the identified plant density criteria. Newmont proposes Dr. Samuel Bamberg to conduct the monitoring effort, and to send the resultant annual monitoring reports to the BLM. BLM may either approve the reports and the ongoing revegetation efforts, or, if the then-current revegetation efforts appear inadequate, require alternate or additional measures. This approach has been utilized with proven success at other area mines, including American Girl and Picacho.

No post-closure maintenance or other corrective actions are anticipated to be needed.

2.1.9 End Use

Following completion of Newmont reclamation and revegetation activities, and the meeting of applicable reclamation and revegetation criteria, the area would be returned to use as wildlife habitat. Potential pit lake water quality impacts to wildlife would be minimized through pit design that results in steep pit walls above and below projected pit lake water levels. This would minimize growth of

adjacent vegetation communities, and thus minimize animal dietary intake of possibly harmful elements. Limited recreational use, such as use of the informational trail for viewing the mine site would continue. BLM would decide at a future date if any perimeter fences should be retained for protection of public health and safety. During reclamation work by Newmont, berms would be constructed around all of the mine pits, and pit access roads would be made inaccessible to vehicles for protection of public safety.

2.2 ALTERNATIVES

2.2.1 Introduction

CEQA requires an EIR to "describe a range of alternatives to the Proposed Action or to its location, that can feasibly obtain the project's basic objectives. . ." (CEQA Guidelines, § 15126(a), Pub. Res. Code Section 21100(s)). The key to alternative analysis under CEQA is to describe a range of reasonable alternatives to the project, or to the location of the project, which would reasonably attain the basic objectives of the project, and evaluate the comparative merits of the alternatives (State CEQA Guidelines, § 15126.6(a)); and, to focus on alternatives capable of eliminating any significant adverse environmental effects or reducing them to a level of insignificance, even if these alternatives would impede to some degree the attainment of the project objectives, or would be more costly (State CEQA Guidelines, § 15126.6(b)).

NEPA also requires that an EIS contain an analysis of alternatives to the Proposed Action (42 U.S.C. § 4332(C)(iii)). The BLM's National Environmental Policy Act Handbook (October 25, 1988, herein, "BLM Handbook") requires that the EIS "[d]escribe the no-action alternative and all reasonable alternatives, including related monitoring requirements, to the same level of detail as the proposed action." The same Handbook section requires that the EIS address "how each alternative, with the exception of the no-action alternative, would generally accomplish the purpose and need for the action..." (BLM Handbook Chapter 5, Sec. (c)(3)(f)(3)). The BLM Handbook also requires that the EIS identify "alternatives considered but eliminated from detailed analysis." (Sec. (c)(3) (f)(3)).

The methodology for analysis of alternatives in this EIR/EIS has taken into consideration the mandates and guidance from the above-referenced sources. Section 2.2.3 describes the No Action Alternative. Section 2.4 presents a broad range of additional potential geographic, design, and technology alternatives that have been considered but eliminated from further detailed analysis. The reasons for eliminating these potential alternatives are that they do not meet a majority of the project objectives as set forth in Section 1.1.4, and in some cases because they would be anticipated to cause a substantially greater impact to the environment than the Proposed Action.

2.2.2 Reduced Footprint Alternative

The Lead Agencies examined this alternative because reducing the amount of additional surface disturbance at the site would reduce environmental effects related to that surface disturbance. The

Reduced Footprint Alternative would create a smaller area of total surface disturbance within the boundaries of the mine. The Big Chief West Overburden/Interburden Storage Area would not be developed under this alternative. In addition, the size of the East Rainbow North and South OISAs would be reduced from those under the Proposed Action within the mine.

The configuration of this alternative is depicted in Figure 2.2-1. The total allowable disturbance for the Reduced Footprint Alternative is presented in Table 2.2-1. Disturbed acreage by specific facility is shown in Table 2.1-1, in the discussion of the Proposed Action. The additional area of surface disturbance requiring permits within public lands would be 142 acres, 47 acres less than the 189 additional acres of public lands that would be disturbed under the Proposed Action. The total area of permitted surface disturbance within the Reduced Footprint Alternative would be 5,104 acres, 47 acres less than the 5,151 acres that would be disturbed under the Proposed Action and prior permitted development.

Mining and processing rates for the Reduced Footprint Alternative would be the same as those for the Proposed Action, and initial capital costs, and ongoing capital and operating costs, would also be similar. The Reduced Footprint Alternative assumes the implementation of all of the environmental protection measures incorporated into the Proposed Action. Also, this Alternative assumes that following the completion of mining, all of the same reclamation methods which are to be applied for the Proposed Action would be undertaken and completed for the Alternative.

Impacts to cultural resources on federal lands managed by BLM would be avoided with this alternative.

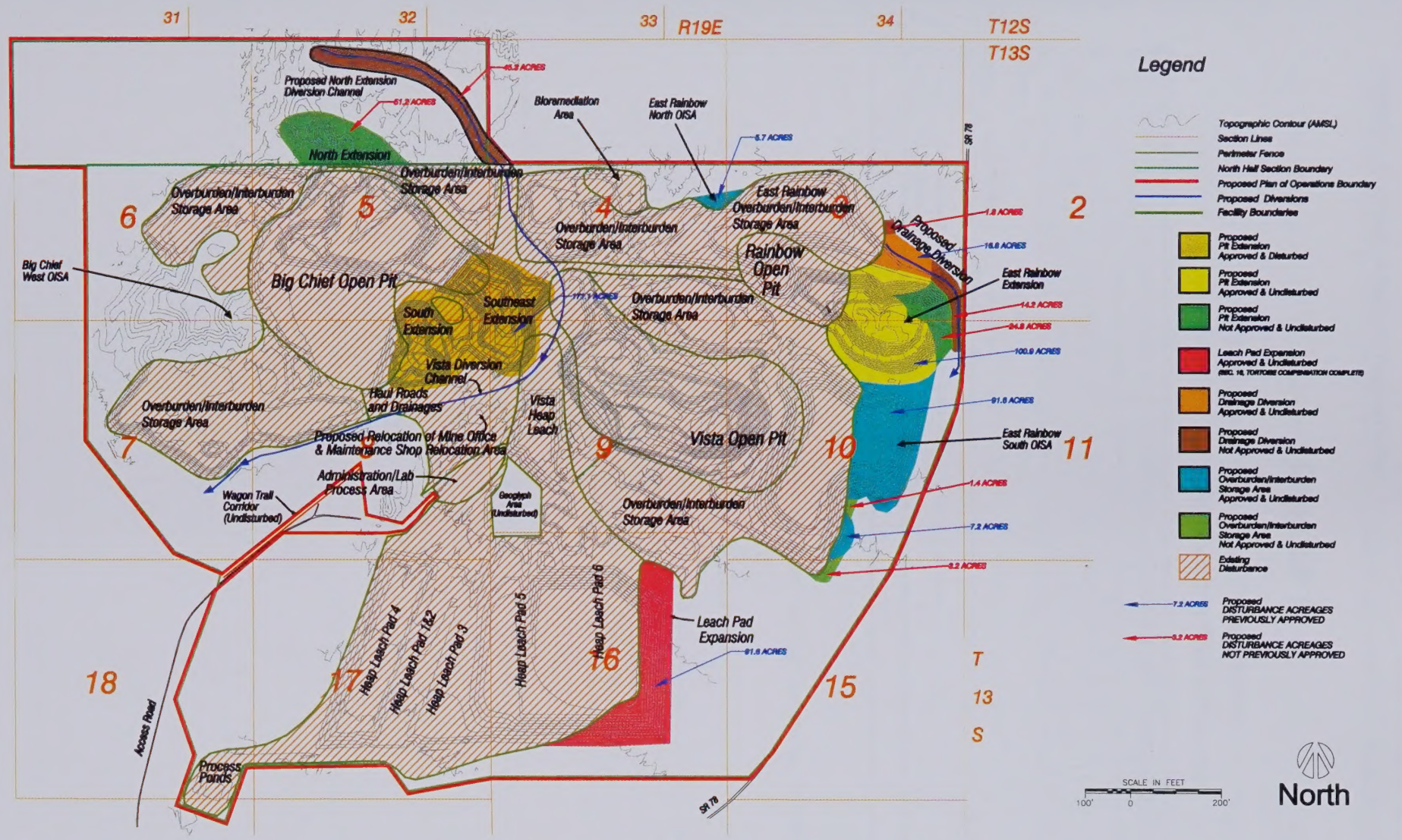
2.2.3 BLM's Preferred Alternative

Chapter V, Section B.2.b. of the BLM NEPA Handbook directs that "[T]he manager responsible for preparing the EIS should select the BLM's preferred alternative. ...For externally initiated proposals, ...the BLM selects its preferred alternative unless another law prohibits such an expression. ...The selection of the preferred alternative should be based on the environmental analysis as well as consideration of other factors which influence the decision or are required under another statutory authority."

Thus, the BLM Preferred Alternative is the alternative that best fulfills the agency's statutory mission and responsibilities, giving consideration to economic, environmental, technical and other factors. BLM has determined that the Reduced Footprint Alternative is the BLM's Preferred Alternative.

2.2.4 No Project Alternative

CEQA requires the No Project Alternative discussion to include the existing conditions at the time the NOP is published as well as what would reasonably be expected to occur in the foreseeable future if the Proposed Action were not approved based on current plans and consistent with available



SOURCE: Newmont Mining Corporation, 1999

7/7/00

BRG CONSULTING, INC.

Mesquite Mine Expansion EIR/EIS

Reduced Footprint Alternative

FIGURE 2.2-1

Table 2.2-1

Reduced Footprint Alternative, Proposed Total Allowable Disturbance

Facility	Cumulative Allowable Disturbance (a)	Existing Disturb.	Additional Proposed Disturbance (Public)	Reallocation Of Disturb. Type (b)	Total Allowable Disturbance
Open Pits	968	762	76	+228	1,272
Heap Leach Pads	1,145	903	0	-30	1,115
OISAs	1,690	1,219	5	-74	1,621
Ancill. Facilities	1,159	771	61	-124	1,096
TOTAL	**4,962**	**3,655**	**142**	**0**	**5,104**

Notes: Disturb. = Disturbance

Totals calculated as if all allowable disturbance occurs; existing clay storage is included under existing OISAs.

(a) Allowed under existing approvals (Consolidated POO).

(b) Proposed reallocation of 228 acres now approved for disturbance as heap leach pads, OISAs, or ancillary facilities, to be made available for open pit disturbance. No new disturbance is proposed in this column. The reallocation is proposed to provide design flexibility in proposed south and southeastern expansion of the Big Chief Pit. These changes accommodate use of 30 acres previously disturbed by the Vista Heap Leach Pad, and other areas permitted for OISA and ancillary facilities disturbance.

Source: Newmont Gold Company, 1999

infrastructure. Under the No Project Alternative, the proposed Mesquite Mine Expansion would not be approved for development. The permits listed in Table 1.7-1 that would authorize the expansion of the mine would not be approved. Previously permitted development would continue to occur but would be limited to the minimum of economically-reasonable ore given recent gold prices. The No Project Alternative addressed in this EIR/EIS is not the maximum mine development that could occur under existing permits and higher gold prices. The following permitted disturbances would occur under the No Project Alternative (Figure 2.2-1):

1. Continuation of mining in Vista and Big Chief pits
2. Increases in the heights of existing OISAs to permitted levels.
3. Continued leaching of gold from the ore in the permitted heap leach pads.

Differences between the No Project Alternative and the Proposed Action are shown in Table 2.2-2.

2.2.4.1 Site Plan and Major Components

The No Project Alternative would result in completion of mining by mid-2001. The resulting site plan would be very similar to the map of existing facilities, Figure 1.3-2.

Continued Heap Leach Pad Use (Permitted)

The ore removed from the open pits would continue to have very low concentrations of gold and other precious metals. The heap leach facility would continue to be used to recover the precious metals from the ore-bearing rock. Ore-bearing rock would be hauled to the heap leach pad where it would be stacked to heights up to 200 feet under existing permits, as compared to 300 feet for the Proposed Action.

Proposed Overburden/Interburden Storage Area (Permitted & Undisturbed)

Under the No Project Alternative, OISAs are anticipated to extend approximately 40 to 300 feet above the surrounding terrain, with average angle of repose slopes ranging from 33-38 degrees.

2.2.4.2 Reclamation Plan

Under the No Action Alternative, mine reclamation would occur in accordance with the existing reclamation plans.

2.3 SUMMARY OF ENVIRONMENTAL IMPACTS

The environmental impacts of the Proposed Action, the Reduced Footprint Alternative and the No Project Alternative are summarized in Table 2.3-1.

Table 2.2-2

Comparison of Key Project Characteristics of the No Project Alternative To Those of the Proposed Action

	No Project	Proposed Action
Project Area	4,962 acres	5,151 acres[2]
Disturbance Area	3,655 acres	5,151 acres
Excavated Material[1]	104 million tons	330 million tons
Out-of Pit Storage Area Volume	81 million tons	242 million tons[3]

Notes: [1] includes ore, interburden and overburden
[2] incorporates conversion of permits for areas of OISA, heap leach pad and ancillary facilities disturbance to open pit disturbance.
[3] Includes material from both permitted and unpermitted mine pits.

Source: Newmont Gold Company, 1999

Table 2.3-1

Summary of Environmental Impacts

Issue Topic	Proposed Action	Reduced Footprint Alternative	No Project Alternative
Geology, Soils and Mineral Resources	With implementation of the proposed design, and with compliance to laws and regulations, impacts to geology, soils and minerals would be less than significant.	With implementation of the proposed design, and with compliance to laws and regulations, impacts to geology, soils and minerals would be less than significant.	Impacts to resources would be less than significant. However, this alternative would not achieve a key applicant objective, that of recovering as much precious metal as possible from the mine site.
Water Resources	With implementation of the proposed design, and with compliance to laws and regulations, water impacts would be less than significant.	With implementation of the proposed design, and with compliance to laws and regulations, water impacts would be less than significant.	This alternative would use 9,000 fewer acre-ft of ground-water than the other alternatives. It would also avoid impacts to ACOE jurisdictional waters and CDFG streambeds.
Biological Resources	This alternative would result in impacts to 321 acres of creosote / desert pavement habitat, 58 acres of microphyll woodland, and 45 acres of upland habitat. It would cause direct impacts to desert tortoise and fairy duster. It would result in impacts to 22.5 acres of ACOE jurisdic-tional waters and CDFG streambeds. However, with implementation of listed miti-gation measures for desert tor-toise and fairy duster, revegeta-tion of drainage diversions and areas disturbed by mining, and deeding more than 1,383 acres of compensation lands to BLM, the identified impacts would be reduced to less than significant.	This alternative would reduce biological impacts of the Proposed Action. However, this alternative would result in impacts to 276 acres of creosote / desert pavement habitat, 57 acres of microphyll woodland, and 34 acres of upland habitat. It would cause direct impacts to desert tortoise and fairy duster. It would result in impacts to 19.5 acres of ACOE jurisdic-tional waters and CDFG streambeds. However, with implementa-tion of listed mitigation measures for desert tortoise and fairy duster, revegetation of drainage diversions and areas disturbed by mining, and deeding more than 1,211 acres of compensation lands to BLM, the identified impacts would be reduced to less than significant.	This alternative would avoid the Proposed Action's impacts to 321 acres of creosote / desert pavement habitat, 58 acres of microphyll woodland, and 45 acres of upland habitat. It would avoid direct impacts to desert tortoise and fairy duster. It would avoid impacts to ACOE jurisdictional waters and CDFG streambeds. However, it would forego the opportunity to preserve in perpetuity 1,200 – 1,400 acres of good desert tortoise habitat through the compensation process.
Cultural Resources	Impacts would be less than significant.	Impacts would be less than significant.	Impacts would be less than significant.
Paleontological Resources	No paleontological resources exist at the site; no significant impacts would occur.	No paleontological resources exist at the site; no significant impacts would occur.	No paleontological resour-ces exist at the site; no sig-nificant impacts would occur.
Transportation	Impacts would be less than significant.	Impacts would be less than significant.	Impacts would be less than significant.

Table 2.3-1

Summary of Environmental Impacts

Issue Topic	Proposed Action	Reduced Footprint Alternative	No Project Alternative
Noise	With continued compliance with existing County and federal noise regulations, no significant impacts would occur.	With continued compliance with existing County and federal noise regulations, no significant impacts would occur.	With continued compliance with existing County and federal noise regulations, no significant impacts would occur.
Air Quality	With implementation of PM_{10} dust control measures listed in the EIR/EIS, there would be no significant impact.	With implementation of PM_{10} dust control measures listed in the EIR/EIS, there would be no significant impact to air quality.	With implementation of PM_{10} dust control measures listed in the EIR/EIS, there would be no significant impact.
Land Use	Impacts would be less than significant.	Impacts would be less than significant.	Impacts would be less than significant.
Recreational Resources	Impacts would be less than significant.	Impacts would be less than significant.	Impacts would be less than significant.
Visual Resources	Low to moderate degrees of visual change would occur, consistent with VRM Class III visual guidelines. Therefore, visual impacts would not be significant.	Low to moderate degrees of visual change would occur, consistent with VRM Class III visual guidelines. Therefore, visual impacts would not be significant.	A low degree of visual change would occur, consistent with VRM Class III visual guidelines. Therefore, visual impacts would not be significant.
Environmental Health and Public Safety	Based on compliance with regulatory requirements, and operating practices used at the Mine since 1984, no significant impacts would occur.	Based on compliance with regulatory requirements, and operating practices used at the Mine since 1984, no significant impacts would occur.	Based on compliance with regulatory requirements, and operating practices used at the Mine since 1984, no significant impacts would occur.
Socioeconomics	Impacts would be less than significant.	Impacts would be less than significant.	Adverse impacts would occur to the area due to loss of jobs, income, government revenues.
Public Services and Utilities	With mitigation measures as listed in the EIR/EIS, impacts would not be significant.	With mitigation measures as listed in the EIR/EIS, impacts would not be significant.	Impacts would be less than significant.

Source: BRG Consulting, Inc., 2000

2.4 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED ANALYSIS

Consistent with the CEQA/META Guidelines discussed in Section 2.2, alternatives to be considered in this EIR/EIS are limited to those that would avoid or substantially lessen any of the significant effects of the project and could feasibly attain most of the basic objectives of the project. Accordingly, all of the developed potential alternatives (except those that are described in Section 2.2) are discussed and evaluated below; first for their ability to avoid or substantially lessen any one or more of the significant environmental effects of the Proposed Action and second, regarding feasibility. The rationale for considering but not selecting these alternatives for further analysis is also provided.

2.4.1 Reduced Mining Alternatives

The location of each of the three pits (Big Chief, Rainbow, and Vista Open Pit) is strictly dictated by the location of the identified ore; there are no locational alternatives for any of the pits. The design for each of the pits was dictated principally by the distribution of identified ore, as constrained by the structural stability of the rock that forms the pit walls and by the ability to economically mine, haul and process the ore. Alternative pit designs could be developed, although none (short of eliminating the pit entirely) would avoid or substantially lessen any of the significant environmental effects of the Proposed Action, and any alternative pit design would reduce conformance with the basic objectives of the Project (to profitably recover as much of the precious metals within the mine as possible, in conformance with the 1872 Mining Act).

2.4.1.1 No Big Chief Pit Extension

The Lead Agencies examined this alternative because reducing the amount of mining at the site would reduce environmental effects related to surface disturbance and other mining activities. The Big Chief Pit Extension and drainage improvements located in the two north half sections owned by SLC would not occur under this alternative. All of the proposed improvements associated with the East Rainbow Pit Extension would occur.

Impacts to biological resources, waters of the United States, and cultural resources on State lands would be avoided with this alternative. This alternative is infeasible because it would reduce conformance with the basic objectives of the Project (to profitably recover as much of the precious metals within the mine as possible, in conformance with the 1872 Mining Act). It would be economically infeasible to proceed with just a portion of the proposed expansion because initial capital expenditure would not include a full return in Newmont's investment required for mining processes (i.e., substantial new equipment, labor) if there was no Big Chief Pit extension. For these reasons, this alternative was rejected.

2.4.1.2 No East Rainbow Pit Extension

The Lead Agencies examined this alternative because reducing the amount of mining at the site would reduce environmental effects related to surface disturbance and other mining activities. The unpermitted East Rainbow Pit Extension, drainage improvements, and OISA located in sections 3, 4, 10 and 15 would not occur under this alternative. All of the proposed improvements associated with the Big Chief Pit Extension would occur.

The primary environmental benefit of this alternative would be reduced impacts to biological resources, waters of the United States, cultural resources, and visual resources. This alternative is infeasible because it would reduce conformance with the basic objectives of the Project (to profitably recover as much of the precious metals within the mine as possible, in conformance with the 1872 Mining Act). It would be economically infeasible to proceed with just a portion of the proposed expansion because initial capital expenditure would not include a full return in Newmont's investment required for mining processes (i.e., substantial new equipment, labor) if there is no East Rainbow Pit extension. For these reasons, this alternative was rejected.

2.4.2 Alternative Operations

2.4.2.1 In-Pit Overburden/Interburden Storage Area (IOISA) Alternative

Both the Proposed Action and the Reduced Footprint Alternative would store some of the waste rock removed from the mine pits back into areas of the pits that have little or no remaining gold ore. Approximately 12.6 million tons of waste rock would be backfilled into the existing pits under the Proposed Action, while 91.6 million tons would be backfilled under the Reduced Footprint Alternative.

Newmont's initial submittal to Imperial County and BLM included information on a IOISA alternative. This alternative would store all new overburden/interburden from project expansion in the existing pits. Under this alternative, no waste dumps (OISAs) would be expanded, avoiding surface impacts to 175.3 acres. Of that area, 123.4 acres have been approved for disturbance by BLM in prior Plans of Operation, but no compensation has yet been made for that area for disturbance to desert tortoise habitat. The other 51.9 acres has no permits, is undisturbed, and no compensation for disturbance has been provided. Implementation of this alternative would result in less surface disturbance, but would result in the burial and potential loss of mineral resources that are not economical with current technology and gold prices in the vicinity of $300 per ounce. It would also result in additional mine pit lake water quality impacts, as described in Baker Consultants, Inc., 1999. This would have adverse impacts to wildlife, as discussed in the ecological risk assessment.

The proposed extensions of the Big Chief and East Rainbow pits would be the same as for the Proposed Action. Drainage facilities also would be substantially the same as for the Proposed Action (Figure 2.1-1) and would integrate with the existing Mesquite Mine drainage structures.

Mining operations for an IOISA Alternative would be very similar to that of the Proposed Action, except that interburden and overburden material resulting from mining expansion would be stored entirely in existing mining pits, instead of above-ground storage areas. Other design aspects of an IOISA Alternative, such as the heap leach pad, liners, and storage pond, would be essentially the same as those identified for the Proposed Action.

An IOISA alternative, in which all the new pit expansion waste rock is placed back in the mine pits, is considered infeasible for three reasons:

1. It would cover gold-bearing ore that is not now economically recoverable at $300 per ounce, but which could be in the future, if there are changes in mining technology or increases in the price of gold, or both. Covering that ore with waste rock would increase the future cost of recovering the gold, and thus make future recovery less feasible.

2. It would substantially increase the costs of material handling over that of the Proposed Action or Reduced Footprint Alternative, adversely affecting the economic viability of the project.

3. It would adversely affect pit lake water quality, with associated impacts to wildlife.

2.4.2.2 Steeper Pit Walls/OISA Slopes

Steeper pit walls and OISA slopes would reduce the area of surface disturbance associated with the Proposed Action; however, such structures would not be stable, considering the seismic risk and materials at the project site. Over the long-term, steeper walls and slopes would be expected to fail with resulting surface impacts to surrounding areas. Approval of steeper pit walls and OISA slopes would result in short-term reduction in the surface disturbance identified for the Proposed Action; however, over the long-term, impacts would be expected to be similar to those identified for the Proposed Action. Steeper OISA slopes would appear less natural, and would result in less natural-looking features. Because the reduction in surface disturbance would only be short-term, this alternative was rejected as infeasible.

2.4.3 Alternative Mine Location

One suggested alternative was to construct and operate a mine at an entirely different location than the Project Area. CEQA Section 15126.6(f)(2) states that only alternative locations that would avoid or substantially lessen any of the significant effects of the project need be considered for inclusion in an EIR. It goes on to state that if no feasible alternative locations exist, the EIR must disclose the reasons for this conclusion. Such an alternative would clearly eliminate all of the residual significant adverse effects of the Proposed Action, although the significant adverse environmental effects of any such alternative project may be greater or less than those of the Proposed Action. In

the absence of an actual location to consider, any attempt to evaluate the environmental impacts of this suggested alternative would be speculative and not add substantially to the environmental analysis presented in this EIR/EIS. Such an alternative would also clearly fail to meet any of the basic objectives of the Proposed Action (to profitably recover as much of the precious metals within the mining claim as possible, in conformance with the 1872 Mining Act). The Applicant has patented mining rights to the minerals located on-site; and there is no feasible alternative site that would allow the Applicant to exercise these rights. In addition, Section 15126.6(f)(2)(B) of CEQA Guidelines states that alternative site evaluations may not be appropriate for mining projects, that "...in some cases there may be no feasible alternative locations for a geothermal plant or mining project which must be in close proximity to natural resources at a given location." Therefore, an alternative site location was eliminated from detailed consideration.

While the Guidelines for the Clean Water Act Section 404(b)(1) require consideration of alternative locations for projects involving fill to Waters of the United States, it is not clear at this time that development of known mineral reserves fall under this provision. BLM, in a letter dated November, 1999, determined that the Section 404 process for the project should proceed concurrently with the EIR/EIS, but on a separate "track." All 404 issues regarding the project would be worked out with the U.S. Army Corps of Engineers, with the participation of EPA personnel, prior to any impacts to Waters of the United States.

2.4.4 Alternative Mining Technologies

The existing Mesquite Mine is permitted as an open pit mine encompassing approximately 4,962 acres. Evaluation of options for the selection of mining techniques and ore processing technologies is generally performed during the pre-feasibility state of mine development. In the case of precious metal mines, this decision is largely based on many factors including the following:

- Ore grade
- Geologic controls on ore zones
- Bulk of mineralization to be mined
- Mineralogy
- Extractive metallurgy
- Process efficiency

Low-grade deposits such as those discovered at the Mesquite Mine, typically do not provide the return on investment necessary to justify capital-intensive mining techniques such as underground mining or capital-intensive milling. These types of deposits are generally mined via the open-pit method and processed via the cyanide heap leach method. In-situ leaching, where the cyanide solution is passed though the mineralization as it lies underground and collected through wells is not considered environmentally acceptable by the applicant and is not discussed further.

The Mesquite Mine has operated as an open pit, cyanide heap leach mine since operations commenced in 1985. The proposed 693-acre expansion would occur in the same geologic

formations and structures as those encountered to date. Capital expenditures for the leach facility have already been made and plans for a leach pad expansion have already been approved by the County, state, and federal agencies. Given the current and foreseeable economic conditions, development of the ore body by underground methods and processing of the orebody via any other method are not economically feasible.

2.4.5 Clean Water Act Section 404(B)(1) Alternatives

The applicant, Newmont Gold Company, a subsidiary of Newmont Mining Corporation, may need a permit from the Army Corps of Engineers, Los Angeles District (ACOE) to discharge dredged and fill material into waters of the United States. Anticipated impacts to Waters of the United States from both feasible alternatives are discussed in Sections 4.1.2 and 4.2.2 of this EIR/EIS. Implementation of mine developments that excluded one or more proposed facilities and thus might reduce impacts to waters were reviewed but were rejected as economically infeasible. This is because these alternatives would not provide a full return on Newmont's investments in equipment and labor. A mine plan that would store all new waste rock in the existing pits was also reviewed, but was rejected because 1) it would cover, and thus make more expensive to access, known lower quality gold ores remaining in the pits; 2) it would cost substantially more to move the waste rock and place it in the pits; and 3) it would result in lower pit lake water quality.

The discharge permit would be issued under ACOE permitting authority pursuant to Section 404 of the federal Clean Water Act. The ACOE would evaluate the application and reach a decision based on federal regulations (33 CFR Parts 320 to 330; 40 CFR Part 230) for implementing Section 404 and on related guidance. The ACOE must complete two independent analyses as part of the decision-making process: a public interest review, and an analysis for consistency with the guidelines for specifications of disposal sites for dredged and fill material, commonly referred to as the 404(b)(1) guidelines. This analysis would be prepared jointly with the ACOE, USEPA, and Newmont participating. The 404 process will proceed concurrently with the EIR/EIS process. BLM ruled in November 1999 that the 404 process discussions should be conducted separately, but in parallel with the EIR/EIS process, in order to avoid potential delays. Public review opportunity would be afforded through the 404 Standard Individual Permit process.

3 Affected Environment

The affected environment described in this section addresses the environment of all on-site project alternatives.

3.1 GEOLOGY/SOILS/MINERAL RESOURCES

3.1.1 General

Within this section, information sources that are not specifically cited are based on data from the following references listed in Chapter 8.0:

- Baker Consultants, Inc., 1999
- Environmental Solutions, Inc., 1987
- Environmental Solutions, Inc., 1993a
- Environmental Solutions, Inc., 1993b
- Sergent Hauskins & Beckwith, 1984
- Gold Fields Mining Corporation, 1987

Baker Consultants, Inc. 1999, *Draft Report Hydrologic and Geochemical Study, Proposed Mesquite Mine Expansion, Imperial County, California,* provides details for a comprehensive hydrogeologic and geochemical study for the mine pit areas, and is the primary reference for discussion of those subjects within this chapter. The other references listed above were prepared in conjunction with previous activities at the Mesquite Mine and provide additional data encompassing the overall mine site and local and regional setting.

Additional incorporated references are specifically cited in the text, where appropriate.

3.1.2 Scope and Regulatory Status

Discussion of the existing geology/soils/mineral resources environment focuses on topics that are pertinent to: (1) seismic effects that could potentially affect the proposed mine expansion and associated facilities; (2) the effects that development and operation of those facilities could have on geology/soils/mineral resources; and (3) geochemical characteristics of rocks in the mine pit areas that have potential to affect water quality.

The Colorado River Regional Water Quality Control Board (RWQCB) in Palm Desert, California, is responsible for issuing Waste Discharge Requirements (WDRs) for the proposed expansion.

Demonstrated project compliance with California Code of Regulations (CCR) Title 27 requirements for mine waste management units would be required for the issuance of the WDRs. Title 27 is designed, in part, to ensure that containment systems for heap leaching of ore maintain integrity during earthquakes. In accordance with Title 27, the proposed leach pad expansion could not be built on land that has been ruptured by Holocene faults (i.e., faults active within the past 10,000 years).

Uniform Building Code (UBC) Seismic Zone 4 requirements, the most stringent in the UBC, would be met during the design and construction of all facilities and structures that are subject to the UBC. Other appropriate civil-structural design criteria include the American Institute of Steel Construction "Specifications for the Design, Fabrication and Erection of Structural Steel for Buildings;" the American Concrete Institute Building Code Requirements for Reinforced Concrete; and the American Society for Testing and Materials, for various construction materials.

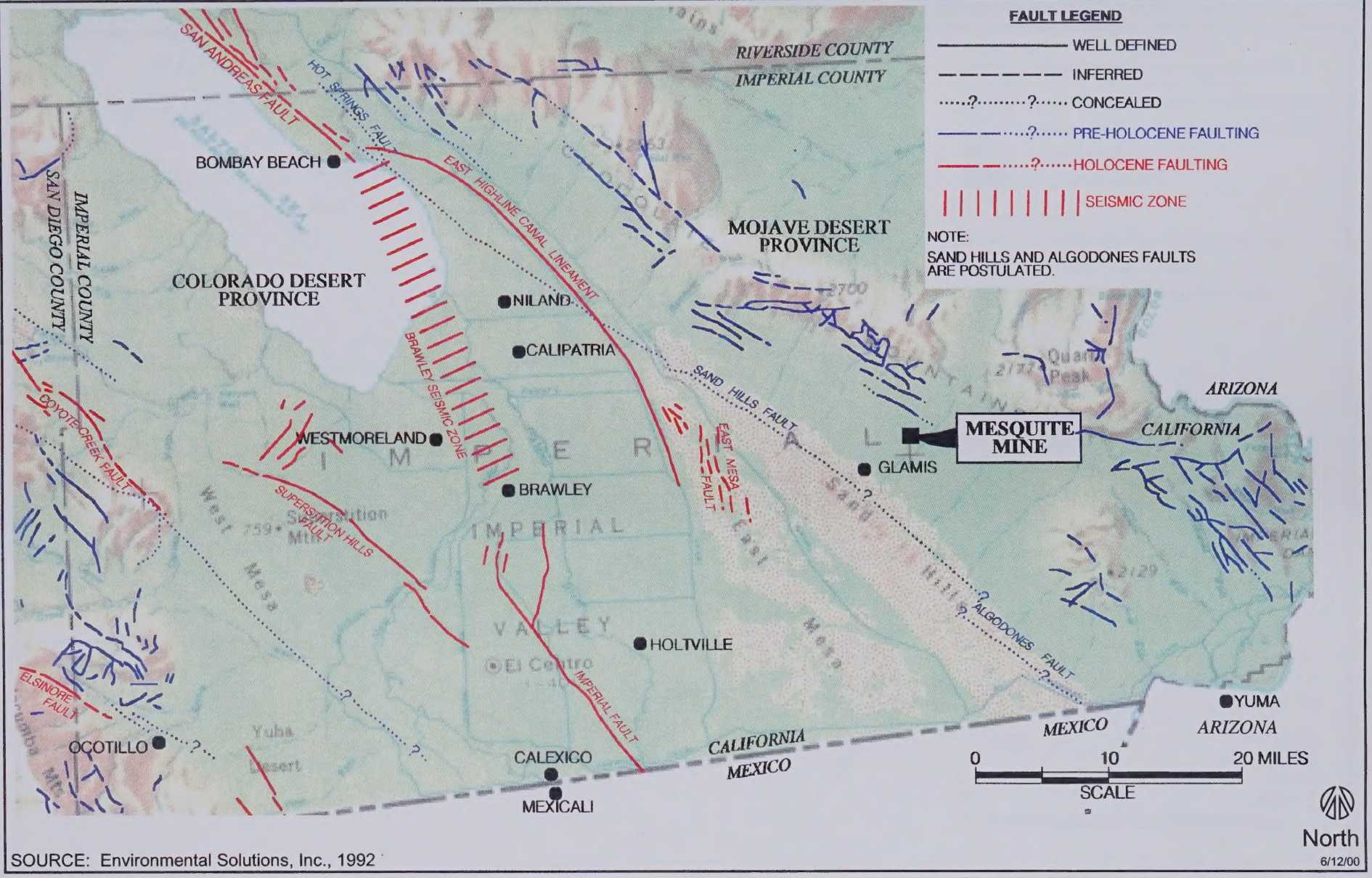
3.1.3 Geologic Setting

3.1.3.1 Regional Geology

The Proposed Action is located at the eastern margin of the Colorado Desert Physiographic Province near its boundary with the Mojave Desert Physiographic Province. The region is characterized by topographical features expressed as northwest-trending mountain ranges separated by valleys. The dominant feature in the area is the Salton Trough (Figure 3.1-1), a large northwest/southeast-trending depression that extends from near Palm Springs to the head of the Gulf of California in Mexico.

The floor of the Salton Trough and the gently sloping trough margins are part of the Colorado Desert province. The mountains east of the Salton Trough, including the Chocolate, Cargo Muchacho, Picacho, and Palo Verde mountains, are part of the Mojave Desert Province. The Mesquite Mine site is located near the top of the gently sloping (average of about 80 feet per mile) trough margin. The gentle slope extending southwestward from the project site area is a piedmont fan, which is an alluvial surface underlain at shallow depth by an eroded rock surface (pediment). Other than the presence of an intricate braided network of shallow incised channels, the piedmont fan surface is relatively featureless. The gently sloping surface terminates at the Algodones Dunes, about 6 miles southwest of the project site.

The Chocolate Mountains reach a maximum elevation of about 2,400 feet at Mount Barrow, about 7 miles north of the project area. The mountains are composed of Precambrian to Mesozoic Age basement rocks (Figure 3.1-2). These are overlain by Tertiary and Quaternary Age nonmarine sediments and volcanic units that are exposed in the foothills. The materials comprising the outcrops near the project area are similar to the materials exposed in the mountains and foothills to the north.



SOURCE: Environmental Solutions, Inc., 1992

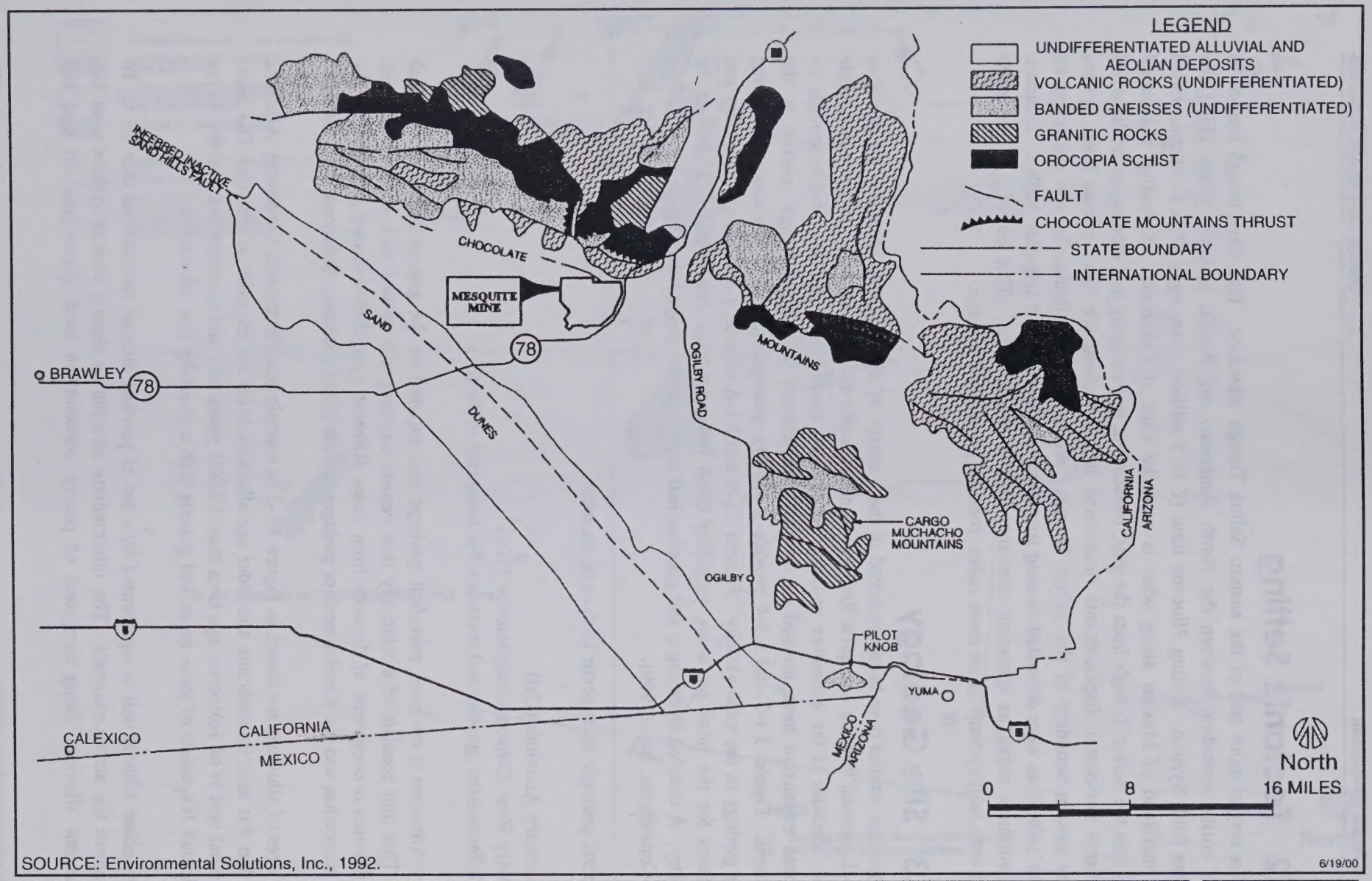
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Mesquite Mine Expansion EIR/EIS

Physiographic Map

FIGURE 3.1-1



SOURCE: Environmental Solutions, Inc., 1992.

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Mesquite Mine Expansion EIR/EIS

Regional Geologic Map

FIGURE 3.1-2

3.1.3.2 Tectonic Setting

The site lies several miles east of the eastern Salton Trough boundary. This large trough formed as a result of crustal spreading between the North American and Pacific tectonic plates along the San Andreas Fault System. During Pliocene time (2 to 5 million years ago), Baja California rifted from the mainland of Mexico along what is now the Gulf of California. Spreading progressed northward into the Salton Trough from the gulf, resulting in the widening and elongation of Imperial Valley. Large horizontal displacements (transverse faulting) along the San Andreas Fault System formed the eastern boundary of the Salton Trough. As the gulf and Salton Trough continued to open, thick sediments were deposited causing subsidence at the flanks of Imperial Valley. Tectonic activity continues today as spreading continues in the trough area. This activity is primarily associated with fault systems 26 or more miles from the Mesquite Mine site.

3.1.3.3 Site Geology

Detailed geologic studies have been conducted in the vicinity of the Mesquite Mine site for previous mine developments, for the Mesquite Regional Landfill, and most recently, for the proposed mine expansion. Because of the extensive geologic information available for the site, studies specific to the proposed expansion have focused on detailed geochemistry and hydrogeology specific to the mine pit areas. Figures 3.1-3 and 3.1-4 provide a vicinity geologic map and cross sections showing premining geology in the mine vicinity. Figures 3.1-5 and 3.1-6 provide a detailed geologic map and cross sections for the mine pit areas, including in-pit basement rock details that are relevant to geochemistry. A detailed hydrologic and geochemical study for the proposed expansion is described in Baker Consultants, Inc. (1999).

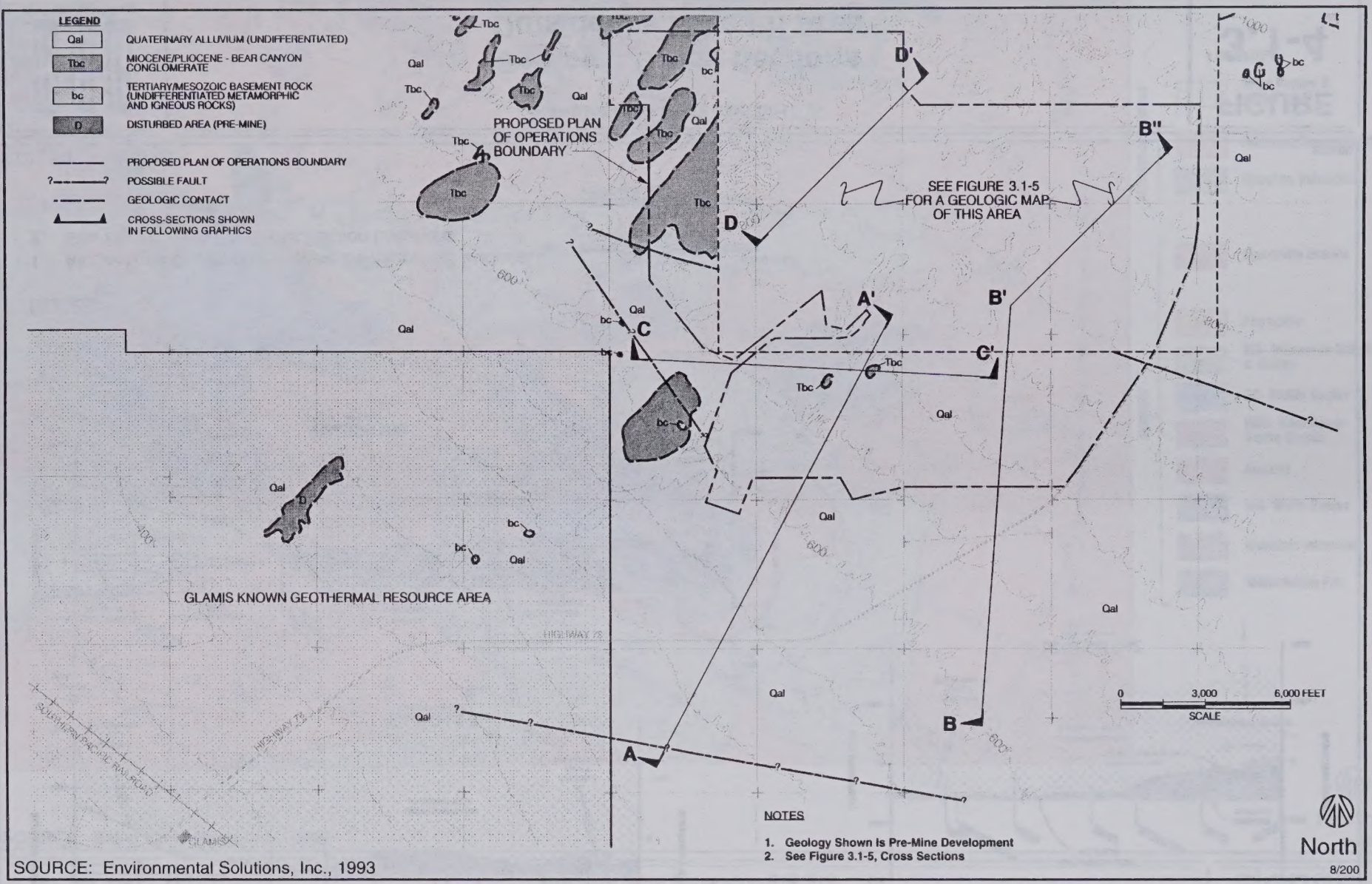
Three general geologic units occur in the site vicinity:

- Quaternary Alluvium (Qal)
- Tertiary Bear Canyon Conglomerate (Tbc)
- Undifferentiated igneous and metamorphic basement rocks (bc)

Quaternary Alluvium is the most prevalent geologic unit exposed on the ground surface in the mine vicinity. This unit consists of a relatively thin veneer covering the eroded rock of the pediment. Exposed alluvium is comprised of deposits from three different ages, differentiated according to the degree of dissection and the development of pedogenic soils (Environmental Solutions, Inc., 1993).

The three ages of alluvium are shown in Figure 3.1-3 as a single undifferentiated Quaternary Alluvium Unit. Within this unit, intermediate and older age alluvium cover the majority of the site. The most recent alluvial unit is of Holocene age (less than 10,000 years old) and is constrained to the active channel floors. It consists of loose sands and gravels with a generally low silt content.

The intermediate alluvial unit is represented by a set of perched alluvial fan surfaces that lie up to four feet above the active channels. The intermediate alluvium is slightly coarser grained than the younger recent alluvium, being composed of poorly consolidated sand, gravel and silt that has



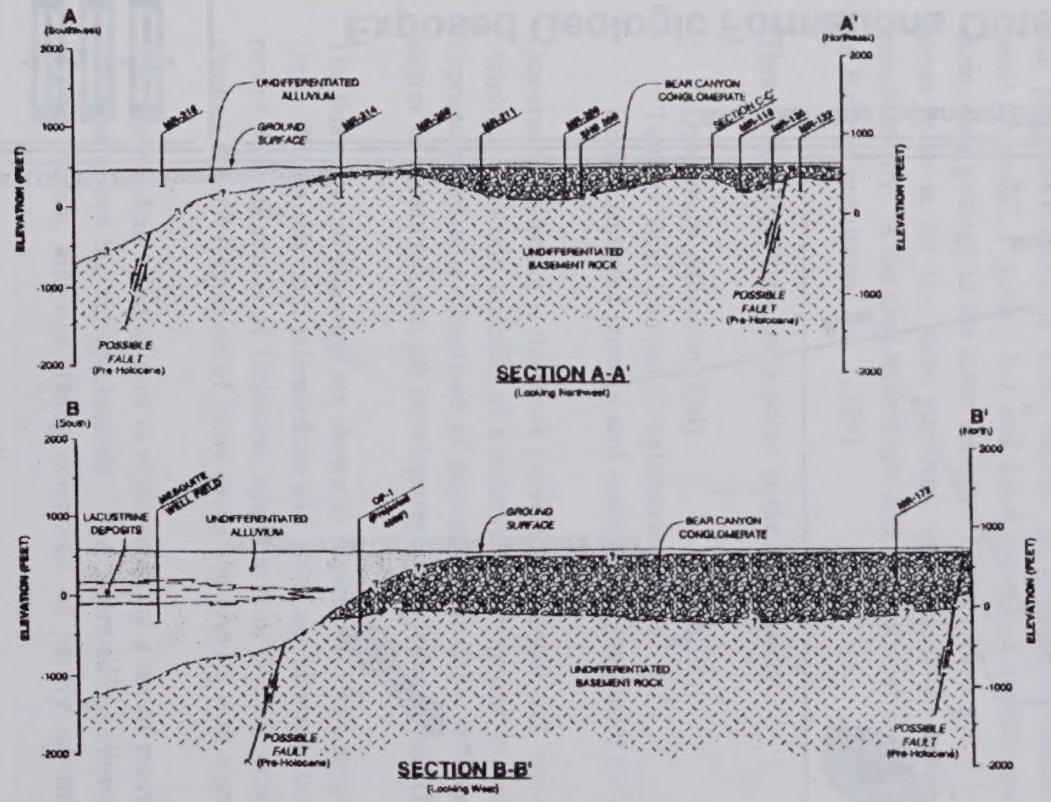
SOURCE: Environmental Solutions, Inc., 1993

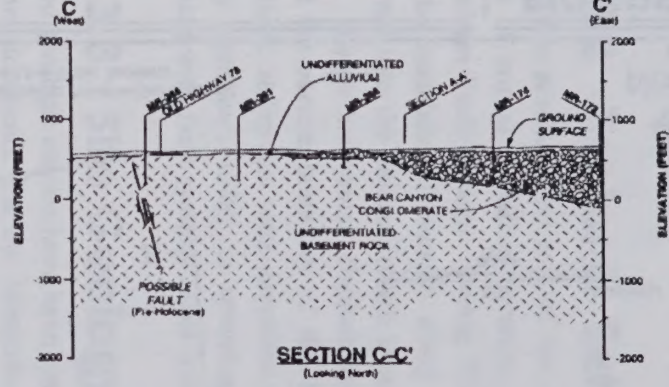
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Mesquite Mine Expansion EIR/EIS

Exposed Geologic Formations Outside the Mine Pit Area

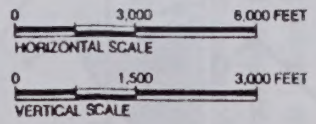
FIGURE 3.1-3





NOTES:

1. All Sections Drawn on Pre-Mine Development Surface.
2. See Figure 3.1-3 For Cross Section Locations.



SOURCE: TRC, 2000.

6/19/00

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Mesquite Mine Expansion EIR/EIS

Geologic Cross-Sections Outside the Mine Pit Area

FIGURE 3.1-4



North

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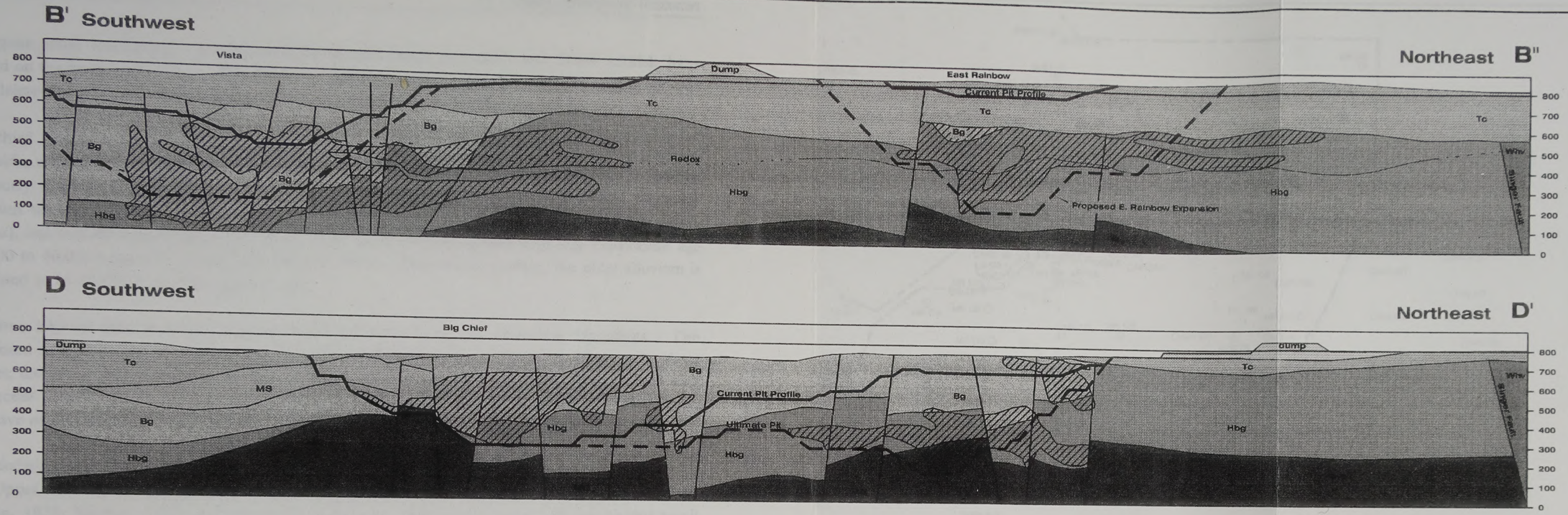
SOURCE: Baker Consultants, Inc., 1999.

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Mesquite Mine Expansion EIR/EIS

Existing Geology in Pit Areas

FIGURE 3.1-5



Legend

TERTIARY - QUATERNARY

- Dump — Mine Dumps
- Tc — Alluvium/Conglomerate
- Tqv — Quechan Volcanics

MESOZOIC

- Kmgs — Muscovite Granite
- Jpeg — Pegmatite
- Jms — MS- Muscovite Schist & Gneiss
- Jbg — BG- Biotite Gneiss
- Jhbg — HBG- Hornblende-Biotite Gneiss
- Jal — Alaskite
- MG- Mafic Gneiss
- Mesozoic Intrusives
- Mzw — Winterhaven Fm.

- Ore
- Current Pit Profile
- Proposed Pit Profile

Scale: 0 200 400 600 1,200

8/4/00

SOURCE: TRC, 2000, modified from Baker Consulting, Inc., 1999

BRG CONSULTING, INC.

Mesquite Mine Expansion EIR/EIS

Geologic Cross-Sections Through the Mine Area

FIGURE 3.1-6



undergone some weathering. A moderately-developed desert pavement and desert varnish have formed on the weathered surface. The weathered surface of the intermediate alluvium ranges between late Pleistocene and early Holocene age (8,000 to 17,000 years old) (Shlemon, 1993).

The third alluvial unit, the older alluvium, is represented by the highest alluvial fan surfaces. This older alluvium unit is conspicuous and widespread with a distinct yellowish-red color. It consists of poorly consolidated sands and gravels that are slightly indurated and weathered. The older alluvium surface displays a continuous and well-developed desert varnish and desert pavement (patina), and well-developed desert soil layers. The older alluvium surface is of late Pleistocene age (35,000 to 40,000 years old) (Shlemon, 1980 and 1993). Beneath the surface, the older alluvium is estimated to be 60,000 to 70,000 years of age.

All three alluvial units were deposited as eroded materials from the Chocolate Mountains. The maximum alluvial thickness overlying the bedrock and basement rock pediment is judged to be about 20 feet, though it varies due to an uneven buried pediment surface. Fine silt deposits associated with the recent Salton Sea, or ancient Lake Cahuilla that previously occupied the Imperial Valley Floor, inclusive of the old shorelines, lie far to the west of the site area and below an elevation of 100 feet.

The bedrock unit underlying the older alluvium is the Bear Canyon Conglomerate (Figure 3.1-4). It is Upper Miocene (5 to 11 million years old) to Lower Pliocene (3 to 5 million years old) in age (Dillon, 1975; Morton, 1977) and consists of nonmarine sedimentary rocks with interbedded basalt flows. The sedimentary units consist of poorly sorted and variably indurated sandstone, conglomerate, and breccia with a sandy to clayey matrix. The formation varies from slightly to moderately well-cemented; the cementation is provided by calcium carbonate and/or a clayey matrix. The conglomerate unit is locally exposed in rounded hills protruding above the piedmont fans (Figure 3.1-3). The thickness of the conglomerate varies and can be several hundred feet or more. In the eastern portion of the mine site, a thick Tertiary clay layer is interbedded with poorly sorted conglomerate indicating that thick clay accumulations may be part of the Bear Canyon Conglomerate lithology.

The basement rock consists of Tertiary volcanic rocks and pre-Tertiary age (greater than 65 million years old) igneous and metamorphic rocks. Foliation in the metamorphic members is well developed, and where exposed, this unit is fresh to moderately weathered. At the surface, the rock appears to be highly fractured and jointed. At depth, these discontinuities become fewer in number and tighter because of confinement by the weight of the overlying rock. Depth to basement rock in the mine vicinity varies from zero at outcrops to depths in excess of 1,000 feet. The gold ore to be mined occurs in gneiss and granitic basement rock in essentially free or native form. It is concentrated in microfractures in minute sizes and amounts.

3.1.3.4 Mine Pit Geochemistry

Mine pit geochemistry is important to consider in the environmental evaluation because of rock-ground water interactions that may occur in the pit walls and floor or in backfilled material

following mining. The bottom portion of the mine pits would be excavated below the elevation at which ground water occurs in the fractured basement rock.

The principal rock types that would be exposed in the mine pits are:

- Quaternary Alluvium
- Tertiary Conglomerate, further differentiated in the Rainbow Pit as:
  - Conglomerate
  - Sand/Silt/Clay
  - Mineralized Conglomerate
- Basement Rock:
  - Cretaceous Muscovite Granite (leucogranite)
  - Jurassic Muscovite Schist and Gneiss
  - Jurassic Biotite Gneiss
  - Jurassic Hornblende-Biotite Gneiss
  - Jurassic Mafic Gneiss

Detailed descriptions of these units and their mineralogy are provided in Baker Consultants, Inc. (1999), along with descriptions of geochemical tests.

The two general geochemical parameters most important to Mesquite mine pit environmental evaluations are: (1) Net Neutralization Potential (NNP) calculated by Acid/Base Accounting (ABA); and (2) metal concentrations.

Excavation and exposure of buried geologic materials can accelerate natural weathering of certain minerals within the material such as sulfide minerals that can generate acid, or carbonate minerals that can neutralize acid. ABA is a term encompassing an array of geochemical evaluations that can be used to determine the net difference between the Acid Generating Potential (AGP) and the Acid Neutralizing Potential (ANP) that occurs in a given rock due to these minerals. The net difference between AGP and ANP is the NNP. The NNP is commonly expressed in terms of tons of calcium carbonate ($CaCO_3$) per kiloton of rock. It is generally accepted that materials with NNP values of less than -20 tons of $CaCO_3$ per kiloton are potentially acid generating; whereas materials with NNP values of greater than +20 tons of $CaCO_3$ per kiloton of rock are clearly net neutralizing. A second approach to predicting acid generation from static tests utilizes the ratio of ANP to AGP (Hutchison and Ellison, 1992). Using this approach, materials with an ANP/AGP ratio of less than 1 are considered potentially acid generating, while a ratio of greater than 3 is considered clearly net neutralizing. Further characterization of materials falling within the range of uncertainty for static tests (i.e., with an NNP falling between -20 and +20, or an ANP/AGP ratio between 1 and 3) is necessary if overall prediction of acid generation potential requires such characterizations. For example, further testing could be warranted if the amount of material represents a notable portion of the rock to be excavated, or the pit wall that will be in contact with water. If the amount of material

in the range of uncertainty is negligible compared to the overall geologic formations that will be excavated, then further testing of the uncertain materials will not provide much benefit. When further testing is necessary, it normally consists of augmenting the ABA data with kinetic testing (e.g., humidity cell or column leach) to determine if net acid production would occur.

Metal concentrations are important because some of the metals can dissolve and become mobile in ground water. The types and concentrations of metals that become mobile is largely dependent on pH and, therefore, NNP. The following subsections provide data on the ABA and metals analyses of rocks in the mine pits.

Acid/Base Accounting

Several sources of data are available for ABA characterization of rock materials collected from the Mesquite Mine. These data have consistently indicated that the Mesquite wall rocks and overburden materials have a net capacity to neutralize acid. These data are consistent with operating experience at the mine.

The Environmental Impact Report/Environmental Assessment (EIR/EA) for the VCR expansion project at Mesquite (Environmental Solutions, Inc., 1987) reported results of ABA rock samples analyzed by Core Laboratories, Inc., of Wheat Ridge, Colorado. Results indicate the materials were alkaline in nature and generally net neutralizing. The mean pH reported was 7.9 and the mean AGP, ANP and NNP values reported were 14.4, 63.6 and 49.2 tons $CaCO_3$ per kiloton of rock, respectively.

Between 1992 and 1995, ABA testing of waste rock and ore from the Big Chief and Vista Pits was performed by the Mesquite metallurgical laboratory. Results of this testing were reported in SMI (1998). Results indicate that the materials tested were slightly alkaline and generally net neutralizing. AGP and ANP values ranged from 0 to 56 tons $CaCO_3$ per kiloton and 9.2 to 233 tons $CaCO_3$ per kiloton, respectively. Total sulfur content was generally low, ranging from 0 to 1.2 percent.

During the last two years, additional ABA determinations were performed on representative rock types collected from the Rainbow Pit and from the north half sections (Sections 5 and 6) at the site. Eighteen core samples and 13 pulp samples obtained from exploration boreholes drilled as part of the Rainbow Pit Expansion of the Mesquite Mine were submitted by SMI for ABA testing by Energy Laboratories, Inc. of Casper, Wyoming (SMI, 1998b). The rock types that were selected for analysis were those that were expected to be exposed in the Rainbow Pit. Additional ABA testing was performed in the spring of 1999, when 111 rock samples were collected during exploration drilling in the north half sections. The latter samples were submitted to American Assay Laboratories of Sparks, Nevada. The results from the ABA determinations performed in the Rainbow Pit and north half sections are summarized in Table 3.1-1 and indicate that the rock types encountered in the Rainbow and north half sections are typically net neutralizing with positive NNP values. Detailed results and discussion of this testing are provided in Baker Consultants, Inc. (1999). That report also

Table 3.1-1

Summary of Acid-Base Accounting Characteristics, Rainbow Pit and North Half-Sections Proposed Mesquite Mine Expansion

Rock Type	Parameter	Units	Rainbow Pit			North Half-Sections		
			Min.	Max	Mean(1)	Min.	Max	Mean(1)
Quaternary Alluvium (Qal)	Carbonate	% $CaCO_3$	--	--	--	--	--	--
	Carbonate	% C	--	--	--	0.010	0.579	0.067
	Sulfide	% S	--	--	--	<0.001	0.006	0.001
	ANP	T $CaCO_3$/kT	--	--	--	1	48	6
	AGP	T $CaCO_3$/kT	--	--	--	0.03	0.19	0.04
	NNP	T $CaCO_3$/kT	--	--	--	1	48	5
Tertiary Sand/Silt/Clay	Carbonate	% $CaCO_3$	1.6	10.8	4.3	--	--	--
	Carbonate	% C	--	--	--	--	--	--
	Sulfide	% S	<0.01	<0.01	<0.1	--	--	--
	ANP	T $CaCO_3$/kT	16	108	43	--	--	--
	AGP	T $CaCO_3$/kT	0.31	0.31	0.31	--	--	--
	NNP	T $CaCO_3$/kT	16	108	43	--	--	--
Tertiary Conglomerate	Carbonate	% $CaCO_3$	0.6	10.6	3.1	--	--	--
	Carbonate	% C	--	--	--	--	--	--
	Sulfide	% S	<0.01	<0.01	<0.01	--	--	--
	ANP	T $CaCO_3$/kT	6	106	31	--	--	--
	AGP	T $CaCO_3$/kT	0.31	0.31	0.31	--	--	--
	NNP	T $CaCO_3$/kT	6	106	31	--	--	--
Tertiary Mineralized Conglomerate	Carbonate	% C	1	5.7	3	--	--	--
	Carbonate	% S	--	--	--	--	--	--
	Sulfide	T $CaCO_3$/kT	<0.01	<0.01	<0.01	--	--	--
	ANP	T $CaCO_3$/kT	10	57	30	--	--	--
	AGP	T $CaCO_3$/kT	0.31	0.31	0.31	--	--	--
	NNP	T $CaCO_3$/kT	10	57	30	--	--	--
Cretaceous Muscovite Granite (Leocogranite)	Carbonate	% $CaCO_3$	--	--	--	--	--	--
	Carbonate	% C	--	--	--	0.034	0.255	0.083
	Sulfide	% S	--	--	--	<0.001	0.003	0.002
	ANP	T $CaCO_3$/kT	--	--	--	3	21	7
	AGP	T $CaCO_3$/kT	--	--	--	0.03	0.09	0.05
	NNP	T $CaCO_3$/kT	--	--	--	3	21	7
Jurassic Biotite Gneiss	Carbonate	% $CaCO_3$	0.7	4	1.2	--	--	--
	Carbonate	% C	--	--	--	--	--	--
	Sulfide	% S	<0.01	0.16	0.2	--	--	--
	ANP	T $CaCO_3$/kT	7	40	12	--	--	--
	AGP	T $CaCO_3$/kT	0.31	5	0.73	--	--	--
	NNP	T $CaCO_3$/kT	5	40	11	--	--	--

Table 3.1-1

Summary of Acid-Base Accounting Characteristics, Rainbow Pit and North Half-Sections Proposed Mesquite Mine Expansion

Rock Type	Parameter	Units	Rainbow Pit			North Half-Sections		
			Min.	Max.	Mean[1]	Min.	Max.	Mean[1]
Jurassic Hornblende Biotite Gneiss	Carbonate	% $CaCO_3$	0.1	5.8	1.5	--	--	--
	Carbonate	% C	0.012	0.696	0.178	0.011	0.579	0.055
	Sulfide	% S	<0.01	1.38	--	<0.001	0.017	0.001
	ANP	T $CaCO_3$/kT	1	58	--	1	48	5
	AGP	T $CaCO_3$/kT	0.31	43	--	0.03	0.53	0.04
	NNP	T $CaCO_3$/kT	1	47	9.7	1	48	5
Jurassic Mafic Gneiss	Carbonate	% $CaCO_3$	5.2	25.5	9.4	--	--	--
	Carbonate	% C	0.624	3.060	1.128	0.011	0.817	0.204
	Sulfide	% S	<0.01	2.05	0.20	<0.001	0.069	0.002
	ANP	T $CaCO_3$/kT	52	255	94	1	68	17
	AGP	T $CaCO_3$/kT	0.31	64	6.3	0.03	2.15	0.05
	NNP	T $CaCO_3$/kT	34	239	69	1	68	17

Source: Baker Consultants, Inc., 1999.

(1) Geometric mean. Values below detection were calculated at the detection limit.

includes specific data for each of the individual samples analyzed. All of the 111 samples from the north half sections and approximately 90 percent of the samples from the Rainbow Pit possess an ANP/AGP ratio of 3 or more, indicating these materials are clearly net neutralizing. Furthermore, the samples from both areas typically have sulfide concentrations at or near the detection limit, indicating generally low potential for sulfide reactivity. The sulfide concentrations in the samples overall are uniformly low, with 95 percent of the samples containing less than 0.1 percent sulfide (as % Sulfur).

None of the samples had a ANP/AGP ratio of less than 1, and only four samples have ratios occurring in the range of uncertainty (ANP/AGP between 1 and 3). Even though these four samples represent a small fraction of the total material that will be excavated or remain in the pit walls, two of the four samples were selected for kinetic testing. The two samples were selected because they contained the highest total sulfur concentrations observed in the Rainbow Pit and, consequently, may provide a worst-case estimate of chemical constituents that could be leached.

One selected sample was tested using a laboratory humidity cell test and one using a column leach test (hornblende biotite gneiss and mafic gneiss, respectively). These types of testing simulate an accelerated weathering process and allow samples of contact water to be collected and analyzed. Results of this testing is reported in SMI (1998). The pH values measured were slightly to moderately alkaline, ranging from 7.9 to 10.1. Neither sample generated acid and both samples exhibited a moderately high neutralizing capacity. Prior to the 20-week kinetic tests, the samples were initially inoculated with an iron-oxidizing bacteria, *Thiobacillus ferrooxidans,* to accelerate the weathering process. At 20-weeks, the samples showed no acid generation and other parameters, such as iron and sulfate concentrations in leachate, gave no indication that acid production was likely to occur. Therefore, there was no need to continue testing beyond the 20-week period. These kinetic tests support the ABA data in indicating that rock to be mined is not likely to be acid-generating. The kinetic tests indicate that even the most sulfidic members of the hornblende biotite gneiss and mafic gneiss rock units are not likely to generate acid.

Metals

Whole rock analyses have been performed on rock samples collected from the VCR Project Area (ESI, 1987), Rainbow Pit (SMI, 1998) and the North Half-Sections (Newmont, 1999). The primary purpose of these analyses is to assay for gold and characterize metals and other chemical constituents associated with gold mineralization. However, the relative abundance of total metals identified in whole rock analyses can also be used to determine if unusually high levels of metals occur that could potentially leach into mine pit lakes or ground water.

Naturally-occurring concentrations of selected metals in samples of Mesquite Mine ore and overburden analyzed for the VCR Project were reported to be below Total Threshold Limit Concentrations (TTLCs) used by the State to categorize material as hazardous waste (22 CCR 66261.24). Mine rock is not subject to hazardous waste regulations, but the referenced study provided the TTLC as a basis for comparison (ESI, 1987).

Whole rock analyses of rocks from the Rainbow Pit (SMI, 1998b) indicate that the chemical composition of the conglomeratic units was consistent with typical surficial soils, sandstones and shales. However, the gneisses contained arsenic, and occasionally selenium and silver, in concentrations that the referenced study identified as higher than average values observed in diabase and igneous rocks in the earth's crust.

A complete tabulation of results from whole rock analyses performed on rock samples from the Rainbow Pit and north half sections is provided in Baker Consultants, Inc. (1999). The chemical composition of the major rock types encountered at these two locations is summarized in Table 3.1-2. Consistent with prior studies, data in Table 3.1-2 show that total metal concentrations in the rock are relatively low. Maximum values for each constituent are well below the respective TTLCs in all cases, and in most cases they are below the respective TTLC by one to two orders of magnitude. Mean concentrations for each constituent are near or below the average value for the earth's crust overall, except for arsenic from both areas and bismuth and thallium from the north half sections. While the mean values for these three constituents are about an order of magnitude greater than the crustal average, these concentrations are not notably high for a mine site. Overall, the data in Table 3.1-2 are consistent with previous studies indicating that the concentrations of total metals in the rock are generally low.

3.1.4 Soils

A soil survey conducted by Borst (1983) for the Mesquite Mine facility, covered the southern half of Section 5 and Sections 8, 17, 20, 21, and 29 of T13S, R19E, SBBB. Based on the similar physiography throughout the project area and on prior analysis of aerial photographs, soils in the expansion area are expected to be similar and occur in approximately the same relative percentages as in the soil survey area. The data presented in this section are based on the soils reported by Borst (1983).

Four major types of soil are present in the approximate proportions shown in Table 3.1-3. All four major soil types are low in nutrients, and tend to occur in thin layers. The most common type, Chuckwalla gravelly loam, contains high concentrations of salts that tend to preclude plant growth. Consequently, soils present in this area are either barren or support sparse amounts of vegetation.

Soils associated with ephemeral drainages are relatively loose and retain the greatest amount of moisture from occasional rainfall. These areas generally support the most substantive plant communities at the project site. The top surface of the higher areas between the drainages generally consists of a relatively dense "desert pavement" that minimizes the ability of rainfall to percolate into the soil.

3.1.5 Mineral Resources

In the Mesquite mine pits, gold ore and minor amounts of silver ore are found disseminated in microfractures of gneiss and granitic basement rock. Exploration and condemnation borings have

Table 3.1-2

Whole Rock Analysis Summary, Rainbow Pit And North Half-Sections, Proposed Mesquite Mine Expansion

Parameter	Rainbow Pit (Mg/Kg)			North Half-Sections (Mg/Kg)			Ttlc(2) (Mg/Kg)	Crustal Average (3) (Mg/Kg)
	Min.	Max.	Mean(1)	Min.	Max.	Mean(1)		
Aluminum	1,260	95,500	9,640	1,800	31,500	9,540	--	81,000
Antimony	<0.05	1.3	0.12	--	--	--	500	0.2
Arsenic	3.8	137	18.0	2	92	9.87	500	1.8
Barium	2.6	206	40.1	10	357	80.0	10,000	425
Beryllium	0.5	0.7	0.28	--	--	--	75	2.8
Bismuth	<0.5	0.25	0.076	<3	7	3.19	--	0.2
Boron	<0.55	6.15	2.41	<3	14	4.46	--	10
Cadmium	<0.05	0.15	0.065	0.2	1.7	0.43	100	0.2
Calcium	1,190	480,000	11,900	900	53,100	14,800	--	36,300
Chromium	<2.25	23.4	8.23	6	145	20.2	2,500	100
Cobalt	0.55	24.2	5.64	2	18	7.84	8,000	25
Copper	7.5	132	21.6	5	93	22.0	2,500	55
Iron	3,720	42,700	14,900	6,200	47,600	25,000	--	50,000
Lanthanum	--	--	--	2	60	15.2	--	30
Lead	<0.75	10.8	4.06	<3	20	4.44	1,000	13
Lithium	1.3	14.4	5.42	--	--	--	--	20
Magnesium	460	16,300	3,380	400	14,500	570	--	20,900
Manganese	11.8	495	181	111	1,051	419	--	950
Mercury	<0.05	0.2	0.062	<0.01	0.27	0.046	20	0.08
Molybdenum	<0.1	5.8	0.55	<1	13	1.76	3,500	1.5
Nickel	1.05	29.1	6.64	2	33	11.6	2,000	75
Phosphorus	210	1,070	485	40	1,850	520	--	1,050
Potassium	300	8,000	1,990	1,000	6,800	2,500	--	25,900
Selenium	0.05	1.6	0.21	--	--	--	100	0.05
Silica	<89	1,790	204	--	--	--	--	277,200
Silver	<0.05	1.45	0.22	--	--	--	500	0.07
Sodium	180	2,240	684	200	3,200	600	--	28,300
Strontium	11.8	84.8	47.5	9	201	44.6	--	375
Thallium	<0.05	0.25	0.079	<2	52	6.53	700	0.5
Tin	<0.05	0.6	0.18	--	--	--	--	2
Titanium	<0.75	374	24.4	100	1,400	200	--	4,400
Vanadium	27.2	12.8	--	<6	71	31.7	2,400	135
Zinc	151	30.6	--	12	214	38.6	5,000	70

Source: Modified from Baker Consultants, Inc., 1999.

(1) Geometric mean. Values below detection were calculated at the detection limit.

(2) Total threshold limit concentration for hazardous waste (California Code of Regulations, Title 22, Section 66261.24).

(3) Reference: American Geologic Institute, 1989, *AGI Data Sheets*, Data Sheet 57.1.

Table 3.1-3

Soil Characteristics[1]
Proposed Mesquite Mine Expansion

Soil Type	Approximate Relative Percentage Of Ground Cover[2]	Nutrients[3]	Salts[4]	General
Unidentified Sandy Loam	10	Low	Nontoxic	Thin, barren, little erosion protection.
Chuckwalla Gravelly Loam	40	Low	High[5]	Desert pavement, barren, low infiltration capability.
Carrizo Very Gravelly Coarse Sand	15	Low	Nontoxic	Ephemeral stream channels, high infiltration, sparse shrub and tree vegetation.
Carrizo Variant Very Gravelly Loamy Sand	35	Low	Nontoxic	As above, with incipient desert pavement.
Total Area (%)	100	N/A	N/A	N/A

Source: Environmental Solutions, Inc., 1993.

N/A = Not Applicable

(1) Soil characteristics from Borst, 1983.
(2) Ground coverage percentage are estimates based on Borst, 1983.
(3) Surface horizon concentrations of major plant nutrients: nitrogen, phosphorous and organic matter.
(4) Concentrations of major salts in soil, not necessarily confined to the surface horizon.
(5) High concentrations of salts are toxic to plants, preventing establishment or growth.

been drilled to determine the extent of the ore bodies. Ore grade material has not been encountered beneath the sites proposed for the expanded heap leach or OOISAs.

The Glamis Known Geothermal Resource Area is adjacent to the west boundary of the project area. The potential for development of these resources is considered low. Geothermal resources have not been produced from the land underlying the mine, and the geology here is not conducive to hosting geothermal resources (i.e., active geothermal plants in Imperial Valley extract resources from sediments at an average depth of 8,000 feet, whereas total sediment thickness underlying the mine ranges from 0 to 1,000 feet). Furthermore, drilling programs conducted at the mine have not encountered geothermal resources.

While marketable sand and gravel may exist on public land encompassed by the Mine, BLM would not permit a sand and gravel operation on active claims associated with the Mine due to potential mining conflicts. Sand and gravel production from existing pits in Imperial County are adequate to meet construction needs (e.g., road building; housing) in the valley. Active sand and gravel pits do exist approximately 5 miles southwest of the mine. The proposed Mine expansion would not affect mining at these locations.

The land encompassed by the mine is not considered by BLM as prospectively valuable for oil and gas. The geology underlying the mine is not conducive to hosting oil and gas deposits.

3.1.6 Faulting and Seismicity

Extensive data are available for faulting and seismicity in the vicinity from both regional studies and site-specific studies. Numerous regional studies have occurred due to the proximity to the San Andreas Fault system, the regional potential for development of natural resources (e.g., water, geothermal power, minerals), and various projects that have been conducted or proposed (e.g., a nuclear power plant proposed for the Yuma, Arizona area) and ongoing mineral development projects.

Detailed faulting and seismicity studies have been conducted for the Mesquite site for previous mine developments and, more recently, for the Mesquite Regional Landfill. This section summarizes relevant information from the Faulting and Seismicity Technical Report for the Mesquite Regional Landfill (Environmental Solutions, Inc., 1992), which is hereby incorporated by reference. This technical report presents a compilation of published and unpublished regional information and site specific information for lands that would be affected by the currently proposed expansion.

Regional Faulting

The Imperial Valley is at the southern end of the active San Andreas Fault System. Figure 3.1-1 shows the southernmost traces of this system, and other active faults in proximity to the Mesquite Mine. As shown in the figure, the active faults that potentially could affect the site include the southern section of the San Andreas, East Mesa, East Highline Canal (lineament), Imperial-Brawley,

Brawley Seismic Zone, Superstition Mountain/Superstition Hills, and Elsinore Faults. Historic surface fault rupture has occurred on all of these faults, except the East Mesa Fault and East Highline Canal Lineament. Estimated maximum probable and maximum credible earthquake (MPE and MCE) magnitudes for each of these active faults are presented in Table 3.1-4. The MPE is the largest earthquake likely to occur with a 100-year return period at a given probability. The MCE is the largest possible earthquake considering the known tectonic framework of an individual fault.

Numerous faults have been mapped in the Chocolate Mountains to the north of the project site. The mapped faults are dominantly northwest-trending, normal or curvilinear thrust faults associated with uplift of the range. All mapped faults are pre-Holocene (i.e., greater than 10,000 years old) (Dillon, 1975; Murry et al., 1980; Higgins, 1990; Jennings, 1992; Maulchin and Jones, 1992). No surface faults have been mapped on the piedmont fans in the project vicinity between the foot of the range and the eastern side of the Imperial Valley.

The closest known Holocene (active) fault to the site is the East Mesa Fault (Heath, 1992). This fault consists of several north-south trending, left-stepping, en echelon normal listric (down-to-the-west) faults with possible lateral movement.

This faulting is related to the pull apart process within the spreading center and not movement along the San Andreas Fault (Heath, 1992). Although the closest known traces of this fault are approximately 12 miles from the Mesquite Mine, a distance of 9 miles is used for the seismicity analysis in this EIR/EIS, based on conservative recommendations provided by Heath (Environmental Solutions, Inc. 1993a). There have been no notable historic earthquakes associated with this fault (United States Geological Survey [USGS], 1992).

Some geologic references for the area indicate the possible existence of a postulated fault (Sand Hills Fault) beneath the Algodones Sand Dunes, as illustrated in Figures 3.1-1 and 3.1-2. The postulated fault may represent the inactive eastern boundary of the Salton Trough spreading center (Heath, 1992). No evidence has been documented to indicate the Sand Hills Fault has ruptured in Holocene time. The active faults currently associated with the eastern boundary of the Salton Trough are now coincident with the East Mesa Fault and possibly the East Highline Lineament. These parallel faults trend north-south and are west of the Algodones Sand Dunes as shown in Figure 3.1-1.

The Algodones Fault, located in the extreme southeastern corner of Imperial County (Maulchin and Jones, 1992), does not join with the postulated Sand Hills Fault. Based on extensive fault studies, this feature does not project into California, as previously mapped, and is considered inactive (Heath, 1992).

Present day transform-faulting coincides with the active southern San Andreas Fault, which continues, but steps over to the south, connecting with the Brawley Seismic Zone (Heath, 1992). Other active fault zones associated with the transform system include the northwest-trending Imperial/Brawley, San Jacinto, and Elsinore faults as shown in Figure 3.1-1. These faults are characterized by dominant, right-lateral movement, and collectively form the boundary between the

Table 3.1-4

Earthquake Seismicity Parameter
Proposed Mesquite Mine Expansion

Fault	Distance And Direction From Site (Miles, Direction)	Maximum Earthquake (M)		Peak Horizontal Ground Acceleration (G)(1)		High Repeatable Acceleration (G)(2)		Duration Of Strong Ground Shaking (Seconds)
		Credible (3)	Probable (4)	Credible	Probable	Credible	Probable	
East Mesa	9.0, W	6.5	6.0	0.20	0.17	0.13	0.11	18
East Highline Canal Lineament	15.0, W	6.5	6.0	0.13	0.09	0.09	0.06	18
Imperial/ Brawley	26.0, W	7.0	6.8	0.08	0.07	0.05	0.05	24
Brawley Seismic Zone	29.0, W	6.25	5.8	0.05	0.04	0.03	0.03	18
Superstition Mountain/ Superstition Hills (San Jacinto Fault Zone)	37.0, W	7.5	7.0	0.07	0.05	0.05	0.03	30
San Andreas	45.0, W	8.25(5)	7.5	0.08	0.04	0.05	0.03	36
Elsinore	52.0, W	7.5	7.0	0.04	0.03	0.02	0.02	30

Source: Environmental Solutions, Inc. 1993.

(1) Joyner & Fumal, 1986

(2) The highest accelerations that are generally sustained for a period of time during an earthquake and are typically 65 percent horizontal ground acceleration.

(3) Maximum Credible magnitudes shown are Moment Magnitudes (Mw) after Maulchin & Jones (1992) and Slemmons (1982). The surface wave magnitudes (Ms) used by Slemmons (1982) are assumed to approximate moment magnitude (Mw). The Mw is the appropriate magnitude scale required for estimating peak accelerations from modern attenuation relationships.

(4) Maximum Probable magnitudes shown were determined using available data relative to: type and amount of displacement, historic seismic events and empirical relationships of fault segment rupture lengths vs. magnitude after Slemmons (1982).

(5) The maximum credible event was calculated using empirical data after Slemmons (1982) for three segment fault lengths totaling 328 miles.

North American and Pacific tectonic plates. All of the regional transform faults are believed to terminate or die out in spreading centers similar to the Salton Trough.

The 1992 Landers earthquake, located about 100 miles to the north of the project site, proved that more than one fault within the same system can rupture simultaneously. In the event that the southern San Andreas Fault was to rupture, other nearby associated faults with the same tectonic framework could rupture. The earthquake magnitude of such a combined event would be dictated primarily by the fault's length and sense of movement. Magnitudes have been assigned to the regional active faults that could influence the project site and are listed in Table 3.1-4.

As shown on Table 3.1-5, if three segments of the San Andreas Fault were to rupture simultaneously between the southern end of the Salton Sea (Bombay Beach) and Slack Canyon (near Parkfield, California in San Luis Obispo County), the total rupture length would be a maximum of 328 miles. Assuming a maximum rupture length of 328 miles, a MCE of M8.25 could occur, resulting in a maximum ground acceleration of 0.08 gravity (g) at the Mesquite site (Slemmons, 1982).

Site Faulting

Siting of the proposed heap leach pad expansion must comply with Title 27, which requires that a new heap leach pile not be built on land that has been rupture by Holocene faults (active within the past 10,000 years). There are no known Holocene faults in the immediate vicinity of the Mesquite Mine (Environmental Solutions, Inc., 1993).

Two sets of pre-Holocene faults exist that are important to the Mesquite Mine mineralization, but would not affect the expansion. An older set strikes to the northwest and is of Oligocene age (i.e., 24 to 37 million years old), the time which gold mineralization occurred locally. A younger fault set strikes to the northeast and displays left lateral oblique slip faulting, which resulted in the displacement of the Bear Canyon Conglomerate. Based on detailed investigations (Environmental Solutions, Inc., 1993), this younger fault set is Pre-Holocene in age (i.e., greater than 10,000 years old). Faults mapped in the mine pits and postulated faults have not ruptured the 35,000- to 40,000-year old alluvial surfaces within the project vicinity.

Seismicity

Most of the large historic earthquakes in the area have occurred on the Imperial-Brawley and San Jacinto fault systems with earthquakes occurring as main shocks followed by after shocks or swarms of small events (Damiata, et al., 1986). Figure 3.1-7 shows the distribution and magnitude of historic earthquakes with epicenters located within 100 km (60 miles) of the site. Within the search radius, there have been over 400 earthquakes with Richter magnitudes of M4.0 or greater.

Earthquakes plotted closest to the site include two events recorded at latitude 33.000, longitude 115.000. These events are based on early earthquake records and include a M5.5 in 1872 and a M4.0 in 1943. The early earthquake records are based on limited information so there is little control over

Table 3.1-5

Fault Parameters
Proposed Mesquite Mine Expansion

Fault	Length (Miles)(1)	Fault Type(2)	Slip Rate (Mm/Year) (3)	Recurrence Interval (Year)(3)
East Mesa	11	N	ND	ND
East Highline Canal Lineament	34	N (ND)	ND	ND
Imperial/Brawley	41	rv	8.6	700
Brawley Seismic Zone	28	rv	ND	ND
Superstition Mountain/Hills San Jacinto Fault Zone	141	rl	1 to 10	150 to 468
San Andreas	328(4)	rl	25 to 34	140 to 360
Elsinore	110	rl	W	694

Source: TRC, 2000

(1) Jennings, 1992,

(2) N = Normal, rv = reverse, rl = right lateral.

(3) Wesnousky, 1986

(4) San Andreas Fault length includes the following three segments:

Salton Sea to Cajon Pass	=	128 miles
Cajon Pass to Highway 166	=	106 miles
Highway 166 to Slack Canyon	=	96 miles
Total Length	=	330 miles

ND = Not Determined for this EIR/EIS

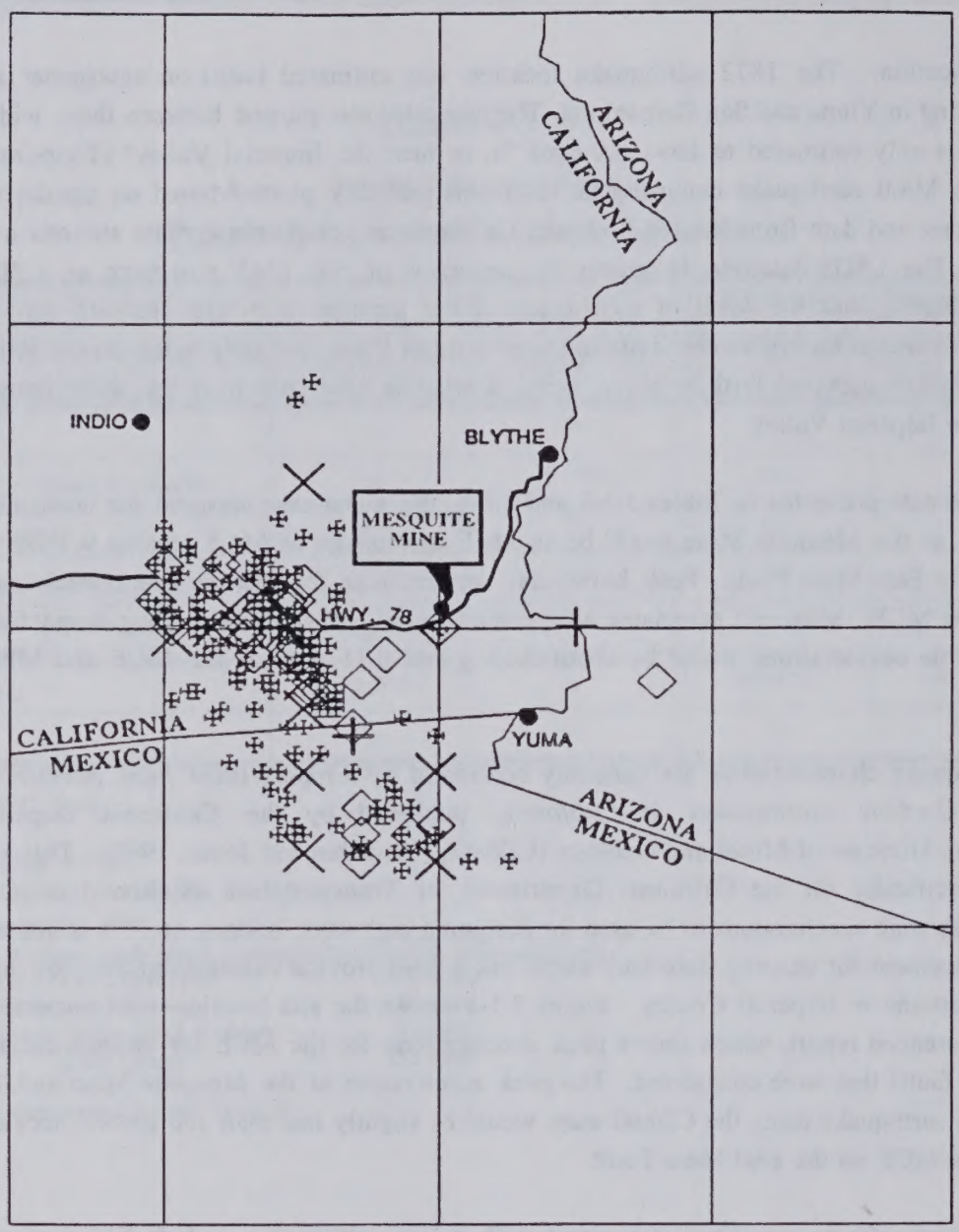
epicenter location. The 1872 earthquake location was estimated based on newspaper reports of ground shaking in Yuma and San Bernardino. The epicenter was plotted between these widely spaced locales, but is only estimated to have occurred "in or near the Imperial Valley" (Toppozada, et al., 1981). The M4.0 earthquake occurring in 1943 was probably plotted based on similar reports of ground shaking and data from limited Southern California regional seismograph stations available at that time. The USGS database designates the accuracy of the 1943 epicenter as a "D" quality location, meaning that the level of confidence of the location is greater than 15 km (9 miles). Because there are no known active faults in the vicinity of these two early epicenters, it is likely that these earthquakes occurred farther to the west, in what is now known as the more active seismic region of the Imperial Valley.

Based on the data presented in Tables 3.1-3 and 3.1-4, the worst-case scenario for horizontal ground acceleration at the Mesquite Mine would be an MCE earthquake of M6.5 located 9 miles from the site along the East Mesa Fault. Peak horizontal accelerations for such an event would range up to 0.20 g for the MCE. MPE and associated acceleration would be M6.0 and 0.17 g, respectively. The high repeatable accelerations would be about 0.13 g and 0.11 g from the MCE and MPE events, respectively.

These earthquake characteristics are generally confirmed by a report titled *Peak Acceleration from Maximum Credible Earthquakes in California*, published by the California Department of Conservation, Division of Mines and Geology (CDMG) (Maulchin and Jones, 1992). This report was prepared specifically for the California Department of Transportation (Caltrans) in determining appropriate seismic accelerations to be used for designing highways, bridges, etc. It is not considered to be a replacement for existing state fault maps, but it does provide valuable information concerning seismic conditions in Imperial County. Figure 3.1-8 shows the site location with respect to a map from the referenced report, which shows peak accelerations for the MCE for various distances from the regional faults that were considered. The peak acceleration at the Mesquite Mine site, estimated for the MCE earthquake using the CDMG map, would be slightly less than the ground acceleration of 0.20 g for an MCE on the East Mesa Fault.

Other secondary effects sometimes associated with major earthquakes include liquefaction, induced landsliding, flooding, and subsidence. Liquefaction, flooding, and subsidence are not applicable to the site because ground water is deep (i.e., at least 140 feet) beneath the site, there is not appreciable nearby surface water, and the thin ground surface layer is supported by the dense Bear Canyon Conglomerate and underlying bedrock.

Induced landsliding is not likely to be an important issue because of the lack of steep natural slopes that might be capable of sliding into mine facilities. Mine pit slopes might experience minor movement during a large earthquake, but considering the relatively low peak accelerations expected to be possible at the site and planned pit slope benching, excessive movement is not likely to occur.



N

LEGEND

EARTHQUAKE MAGNITUDES:

4 5 6 7

NOTE:
EPICENTERS SHOWN OCCURRED BETWEEN 1800 AND 1992 WITH MAGNITUDES GREATER THAN 4.0.

REFERENCE: U.S. GEOLOGICAL SURVEY, NATIONAL EARTHQUAKE INFORMATION CENTER DATA TAKEN FROM THE EARTHQUAKE DATA BASE SYSTEM

0 40 80 MILES

SOURCE: Environmental Solutions, Inc., 1992.

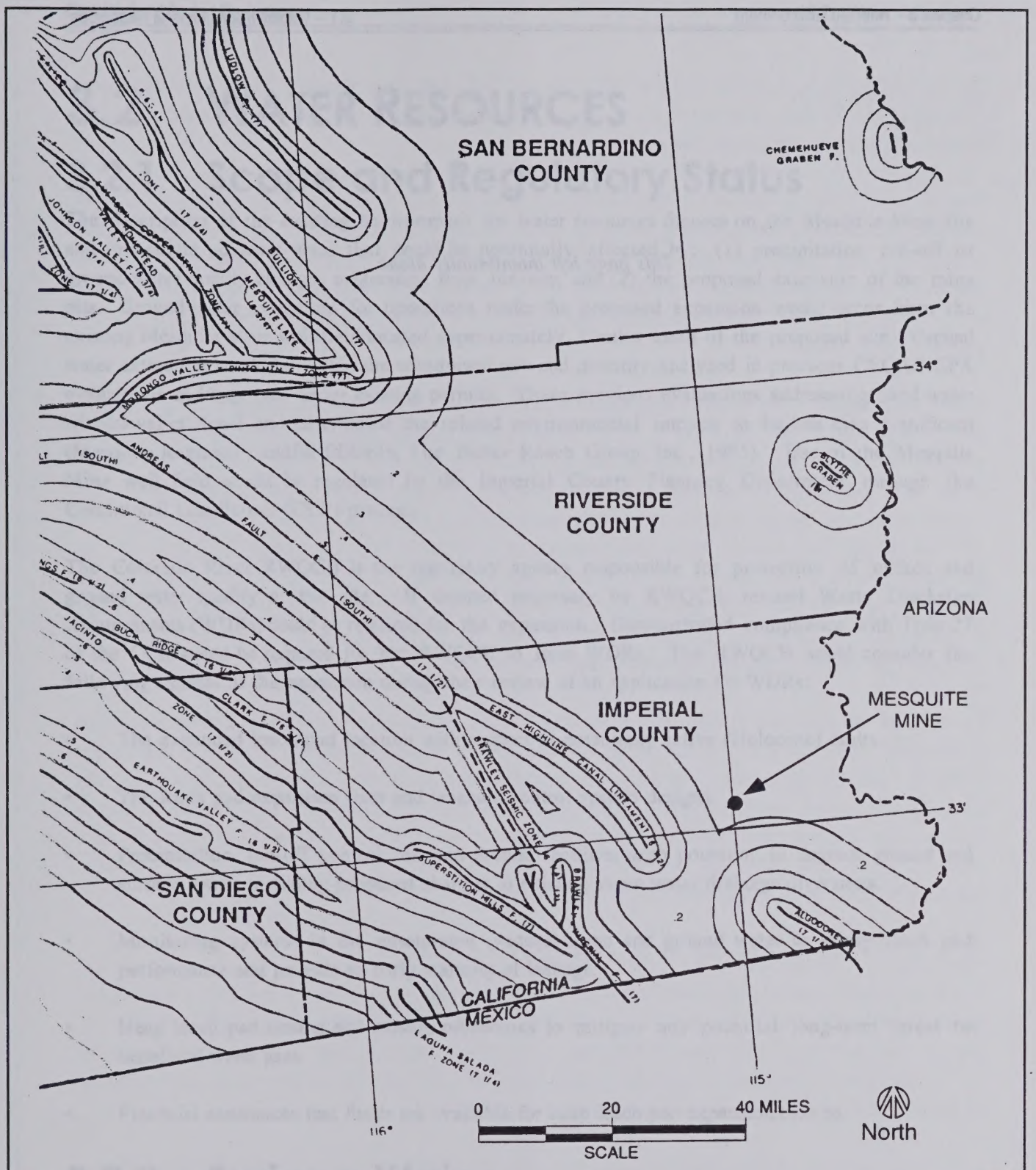
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Mesquite Mine Expansion EIR/EIS

Historic Epicenter Map

FIGURE 3.1-7



SOURCE: Environmental Solutions, Inc. 1992

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Proposed Mesquite Mine Expansion EIR/EIS

Peak Acceleration From MaximumCredible Earthquakes

FIGURE 3.1-8

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3.2 WATER RESOURCES

3.2.1 Scope and Regulatory Status

The description of the existing environment for water resources focuses on the Mesquite Mine site and immediate adjacent areas that could be potentially affected by: (1) precipitation run-off or ground water quality changes originating from the site, and (2) the proposed extension of the mine pits. Ground water extraction for operations under the proposed expansion would occur from the existing Mesquite Mine well field located approximately 3 miles south of the proposed site. Ground water extraction would be within the withdrawal rate and quantity analyzed in previous CEQA/NEPA evaluations and approved under existing permits. These previous evaluations addressed ground water withdrawal in detail and determined the related environmental impacts to be less than significant (Mesquite Regional Landfill EIR/EIS, The Butler Roach Group, Inc., 1995). Use of the Mesquite Mine well field would be regulated by the Imperial County Planning Department through the Conditional Use Permit (CUP) process.

The Colorado River RWQCB is the regulatory agency responsible for protection of surface and ground water quality at the site. If deemed necessary by RWQCB, revised Waste Discharge Requirements (WDRs) could be required for the expansion. Demonstrated compliance with Title 27 of the CCR would be required for the RWQCB to issue WDRs. The RWQCB would consider the following aspects of the expansion during their review of an application for WDRs:

- The expanded leach pad location with respect to potentially active (Holocene) faults.
- The leach pad expansion liner and leachate control system designs.
- Precipitation run-off control, on and around facilities with potential to degrade ground and surface water, including proposed changes to existing storm water drainage diversions.
- Monitoring systems in the unsaturated (vadose) zone and ground water to verify leach pad performance and provide an early warning of leakage.
- Heap leach pad rinsing and closure procedures to mitigate any potential long-term threat to beneficial water uses.
- Financial assurances that funds are available for heap leach pad expansion closure.

3.2.2 Surface Water

Regionally, the Mesquite Mine is located within the Salton Sea Drainage Basin, a closed hydrologic system in which surface drainage flows to an internal point, or sink (the Salton Sea) and subsequently evaporates. Within this basin, the source of surface water is primarily imported irrigation water from

the Colorado River, which enters the basin via the All American Canal. The Coachella Canal, approximately 15 miles southwest of the site and 1 mile west of the Algodones Sand Dunes, is the closest perennial surface water feature.

Precipitation normally takes the form of intense but isolated rainstorms. Precipitation run-off, which occasionally occurs in several relatively small, normally dry washes that traverse the site, does not drain to the Salton Sea. Instead, the brief flows that occur in these washes percolate into the shallow, loose wash bottom soils and/or evaporate. Excess flow from any infrequent larger flows would terminate at the Algodones Sand Dunes, which form a natural topographic barrier above the adjacent desert floor.

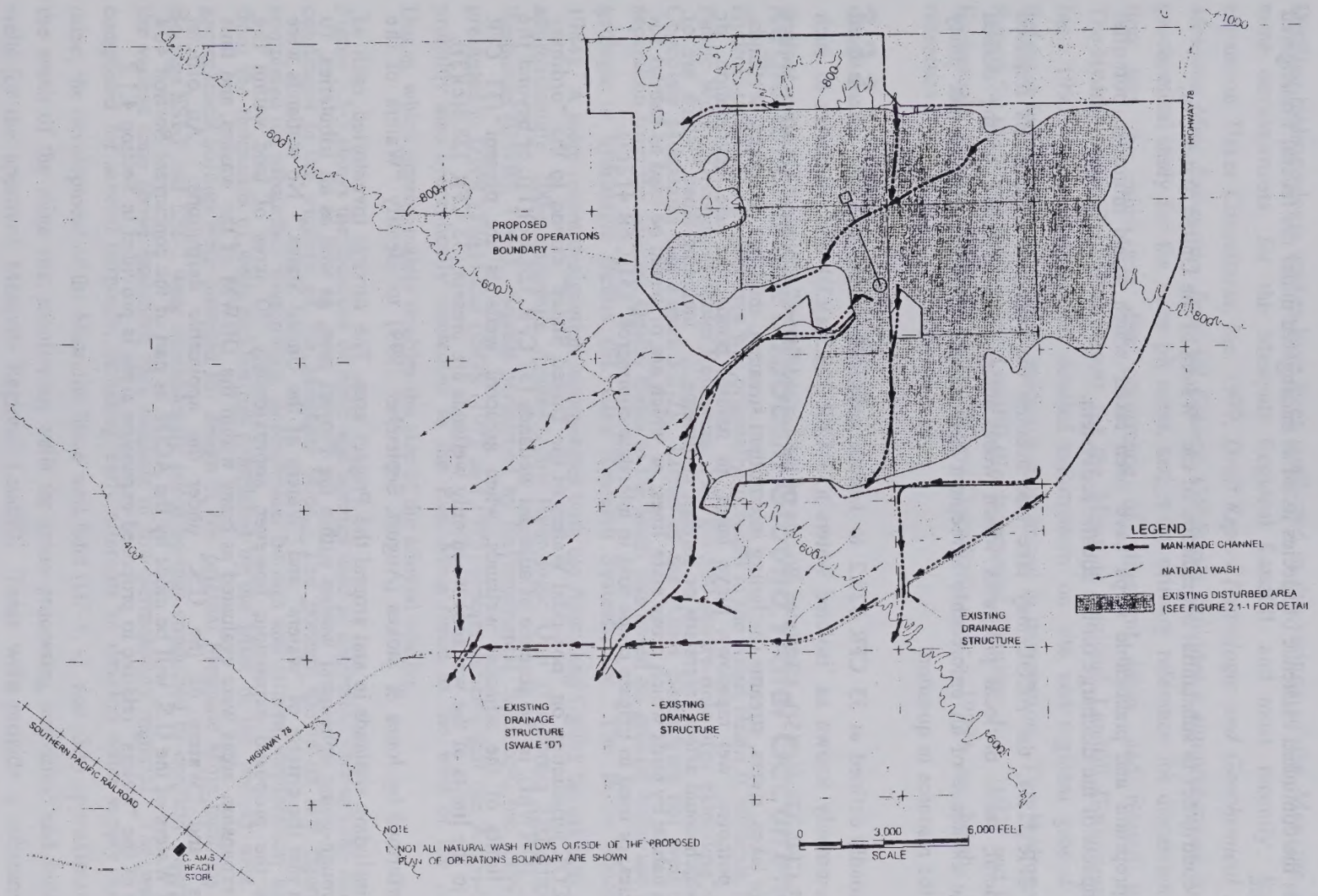
Flows that do occur in the washes, upgradient from the dunes, usually last for periods of less than one hour, during which time the flow is highly turbid due to natural erosion of the unvegetated wash bottoms and sides. Observations at the Mesquite Mine indicate that such short duration, measurable flows occur infrequently. The magnitude of run-off that can occur in the area during large storms was calculated for the design of three swales provided in an 8.5-mile realignment of State Route 78 (SR 78) around the Mesquite Mine area, completed in 1988. The combined peak flow for the 10-year storm at these three swales is about 4,000 cubic feet per second (cfs) (Environmental Solutions, Inc., 1987b). The majority of the drainage area contributing to this flow is from the flanks of the Chocolate Mountains, upgradient from the mine. Figure 3.2-1 shows the existing drainage configuration through and around the mine site.

Mining that has occurred to date in the Big Chief, Vista and Rainbow pits has progressed downward into ground water that occurs in the joints and fractures of the basement rock, so that ground water now seeps into the mine pits. Without the proposed expansion, removal of water from the mine pits (e.g., for dust control) would cease and lakes would occur in the pit bottoms. The pit lakes would be isolated from surface water. Because the hydrology and water quality of the pit lakes would be a result of interactions primarily between ground water seepage and evaporation, the pit lakes are discussed in more detail along with ground water in Section 3.2.3.

3.2.2.1 Waters of the United States

The U.S. Army Corps of Engineers (ACOE), under Section 404 of the Clean Water Act, regulates the discharge of dredged or fill material into "Waters of the United States" (33 USC 1251-1376). Permits must be obtained from the ACOE prior to initiating discharges into jurisdictional "Waters of the United States." Pursuant to applicable regulations (40 CFR 230.10), no permit for the discharge of dredged or fill material would be granted by the ACOE if:

- There is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem;
- If the discharge causes or contributes, after consideration of disposal site dilution and dispersion, to violations of any applicable state water quality standard;



SOURCE: Butler Roach Group, Inc., 1994; revised TRC, 2000

8/4/00

BRG CONSULTING, INC.

Mesquite Mine Expansion EIR/EIS

Existing Drainage

FIGURE 3.2-1

- Violates any applicable toxic effluent standard or prohibition;
- Jeopardizes the continued existence of species listed as endangered under the federal Endangered Species Act;
- Causes or contributes to substantial degradation of the "Waters of the United States"; or,
- Unless appropriate and practicable steps have been taken which would minimize potential adverse impacts of the discharge on the aquatic ecosystem.

Pursuant to 33 CFR 325.4, the ACOE may take into account the existence of controls imposed under other federal, state, or local programs which would achieve the objective of the desired condition, or the existence of an enforceable agreement between the applicant and another party concerned with the resource in question.

"Waters" are broadly defined at 33 CFR 328.2 to include non-tidal waters, including intermittent watercourses (commonly known as 'isolated waters')(33 CFR 328.3(a)(3)) and tributaries to such watercourses (33 CFR 328.3(a)(5)). "Isolated Waters of the United States" include "All other waters such as *intrastate* lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation, or destruction of which could affect interstate or foreign commerce...", including those "which are or would be used as habitat by birds which cross state lines; or which are or would be used as habitat for endangered species; or used to irrigate crops sold in interstate commerce" (51 CFR 41217).

The limits of ACOE jurisdiction on "non-tidal Waters of the United States" extend to the "ordinary high water mark" (OHWM), in the absence of adjacent wetlands (33 CFR 328.4(c)(1)); or beyond the OHWM to the limits of the adjacent wetlands, when adjacent wetlands are present (33 CFR 328.4(c)(2)); or to the limits of the wetlands when only wetlands are present (33 CFR 328.4(c)(3)).

Surveys were performed by Jones & Stokes (August, September 1999) to identify "Waters of the United States," including wetlands in and around the Project area. The surveys inventoried each of the principal through-going ephemeral washes within the Project area, as well as all tributaries, to determine which met the criteria of "waters" and "Waters of the United States." No wetlands were identified within the proposed expansion; however, approximately 20 acres of land within the proposed Mine expansion areas were evaluated as being within the OHWM of the washes, and thus may be "waters" and "Waters of the U.S." under the applicable definitions. An official determination of Waters of the U.S. will be made by the ACOE as part of the concurrent Section 404 process. A map of the "waters" relative to proposed expansion areas is provided in Section 4.1.2.

3.2.3 Ground Water

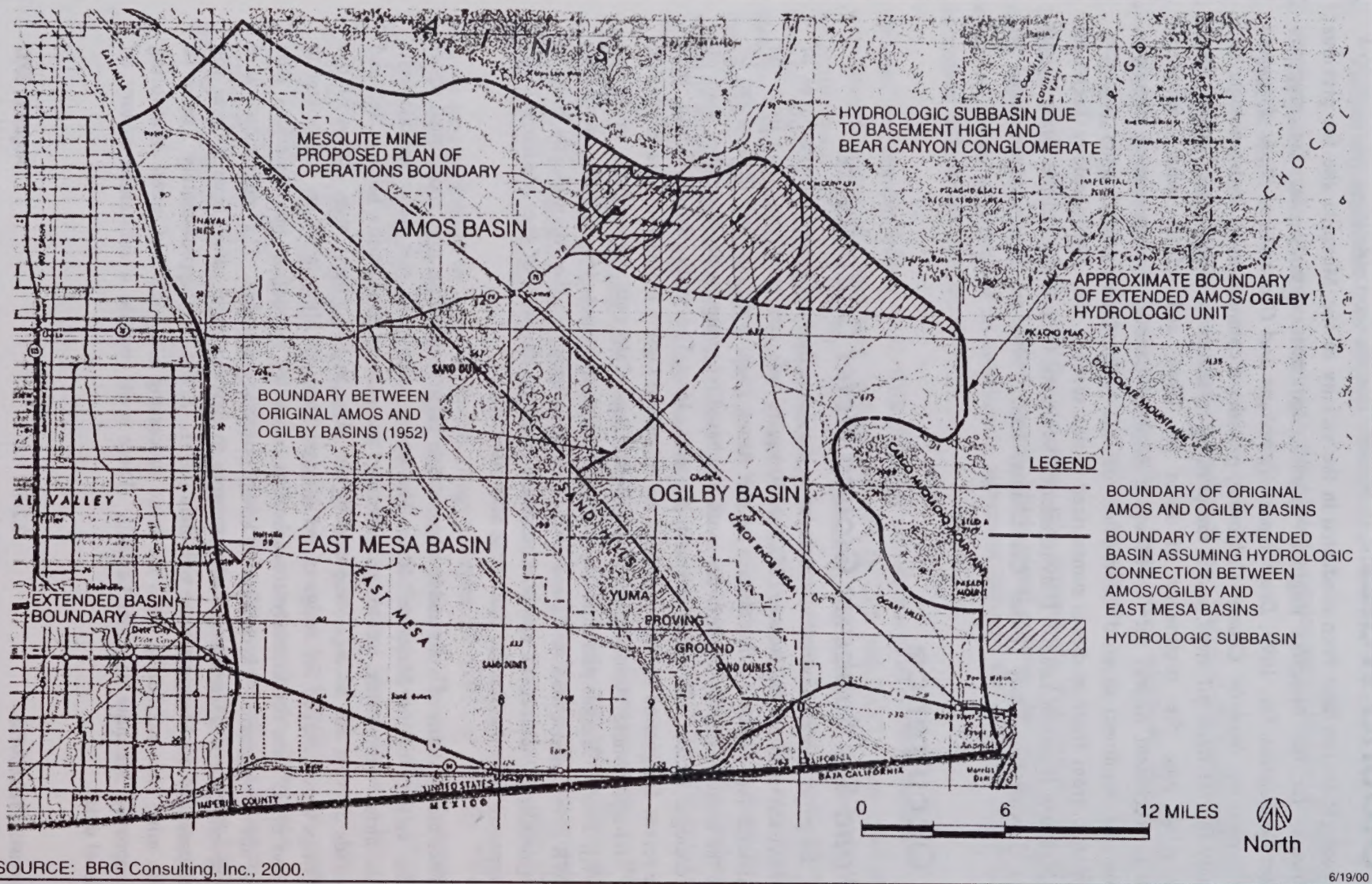
Detailed hydrogeologic studies have been conducted in the vicinity of the Mesquite site for previous mine developments, for the Mesquite Regional Landfill, and most recently, for the proposed expansion. Baker Consultants, Inc. 1999, *Draft Report Hydrologic and Geochemical Study, Proposed Mesquite Mine Expansion, Imperial County, California*, provides a comprehensive hydrogeologic and geochemical study for the mine pit areas, and is the primary reference for discussion of ground water flow into the mine pits, the occurrence of mine pit lakes, and related water chemistry. The Hydrogeology Technical Report for the Mesquite Regional Landfill (Environmental Solutions, Inc., 1993) contains additional detailed information on site and regional ground water resources. Relevant information from these studies is summarized in this section. The Hydrogeology Technical Report for the Mesquite Regional Landfill (Environmental Solutions, Inc., 1993) and the Draft Report Hydrologic and Geochemical Study (Baker Consultants, Inc., 1999) are hereby incorporated by reference.

3.2.3.1 Occurrence

Regional and Site Subbasin Ground Water Occurrence

Hydrologically, the project area was originally included in the Amos Basin (California Department of Public Works, Division of Water Resources, 1952), a 150-square-mile area extending south from the Chocolate Mountains (see Figure 3.2-2). Limits of the Amos Basin were not well defined and its separation from the adjacent Ogilby Basin to the south was based on ground water use rather than on geologic or hydrologic factors (St. Clair Research Systems, Inc., The Butler/Roach Group, Inc., 1984). A more recent designation incorporates both the Amos and Ogilby basins into one combined, approximately 300-square-mile Amos-Ogilby Hydrologic Unit (California Department of Water Resources [DWR], 1964). Studies performed by Environmental Solutions, Inc. (1992b) using data presented in DWR (1964) and USGS (1972 and 1975) reports indicate that the Amos-Ogilby Basin is probably also hydraulically connected to the East Mesa Basin to the west of the Algodones Sand Dunes, which approximately doubles the size of the alluvial aquifer.

Figure 3.2-3 shows the locations of wells and borings used to determine vadose zone and ground water conditions in the vicinity of the Mesquite Mine. The borings shown on this figure include wells completed for subsurface monitoring, geotechnical borings and mineral exploration borings, selected from the thousands of wells and borings completed by the Mine in the project area. Most of the geotechnical borings were installed for design of the original Mesquite Mine facilities. Geotechnical Borings ESI-1 and ESI-2 were continuously cored borings conducted to confirm interpretations that the vadose zone above basement rock consists of low-permeability material. The wells shown were completed for several purposes, including: early attempts to develop water supply sources near the mine; the development of the Mesquite Mine well field (GF-1, -2, and -3A) approximately 3 miles to the south of the mine site; monitoring wells for mine processing activities; and initial monitoring wells for the approved Mesquite Regional Landfill. These wells provide a substantial history of ground water level data.



SOURCE: BRG Consulting, Inc., 2000.

6/19/00

BRG CONSULTING, INC.

Mesquite Mine Expansion EIR/EIS

Groundwater Basin Boundaries

FIGURE 3.2-2

LEGEND

- GW-4 — GROUND WATER MONITORING WELL
- MBH-1 — GROUND WATER OBSERVATION WELL
- V-1 — VADOSE ZONE MONITORING WELL
- GF-1 — WATER WELL
- MR 194 AND OP-1 — GOLD FIELDS EXPLORATION BORING
- SHB1 — SERGENT, HAUSKINS AND BECKWITH BORINGS: GENERAL SITE GEOTECHNICAL BORING
- SHB2 — MILL SITE GEOTECHNICAL BORING
- SHB-20B — DEEP GEOTECHNICAL BORING (T.D. 422')
- TP-1 — SERGENT, HAUSKINS AND BECKWITH TEST PIT
- ESI-1 — ENVIRONMENTAL SOLUTIONS, INC. BORING
- LGW-1 — LANDFILL GROUND WATER MONITORING WELL

NOTE

1. WELLS SM 63, SM 241 AND WT-2 WERE USED FOR EXPLORATION WATER SUPPLY AND HAVE BEEN REMOVED BY MINING ACTIVITIES. THEIR INDICATED LOCATION IS APPROXIMATE.

PROPOSED PLAN OF OPERATIONS BOUNDARY

SHB1-17, SHB1-16, SHB1-15, SHB1-14, SHB1-13, SHB1-12, SHB1-11, SHB1-10, SHB1-9, SHB1-8, SHB1-7, SHB1-6, SHB1-5, SHB1-4, SHB1-3, SHB1-2, SHB1-1

SHB2-1, SHB2-2, SHB2-3, SHB2-4, SHB2-5, SHB2-6, SHB2-7, SHB2-8, SHB2-9, SHB2-10, SHB2-11, SHB2-12, SHB2-13, SHB2-14, SHB2-15, SHB2-16, SHB2-17, SHB2-18, SHB2-19

SHB-20B

SM 63 (SEE NOTE 1)

SM 241 (SEE NOTE 1)

WT-2 (SEE NOTE 1)

SM 222, SM 224

SINGER WELL

GW-1, GW-2, GW-3, GW-4, GW-5, GW-6, GW-7, GW-8a, GW-9

LGW-1

ESI-1, ESI-2

TP-1, TP-2, TP-3, TP-4, TP-5

V-1, V-2, V-3, V-3A, V-4, V-5, V-6, V-7, V-8, V-9, V-10

MCR-80

MR 112, MR 120, MR 122, MR 144, MR 159, MR 160, MR 162, MR 163, MR 164, MR 165, MR 168, MR 169, MR 170, MR 171, MR 172, MR 173, MR 174, MR 175, MR 176, MR 190, MR 191, MR 193, MR 194, MR 197, MR 198, MR 199, MR 200, MR 201, MR 202, MR 203, MR 204, MR 205, MR 206, MR 207, MR 208, MR 210, MR 211, MR 212, MR 213, MR 214, MR 215, MR 216, MR 217, MR 221, MR 252, MR 253, MR 254, MR 255, MR 256, MR 257, MR 258, MR 259, MR 260, MR 261, MR 265, MR 266, MR 267, MR 268, MR 269, MR 270, MR 271, MR 272, MR 273, MR 274, MR 277, MR 278, MR 290, MR 295, MR 296, MR 304, MR 307, MR 308, MR 367, MR 377, MR 418, MR 454, MR 483, MR 485, MR 492, MR 501, MR 525, MR 560, MR 584, MR 633, MR 66, MR 67, MR 70, MR 101, MR 102, MR 478, MR 670

HIGHWAY 78

SOUTHERN PACIFIC RAILROAD

GLAMIS BEACH STORE

OLD VISTA WELL (ABANDONED)

MBH-1, MBH-2, MBH-3, GF-1, GF-2, GF-3A

TRACT 38

0 3,000 6,000 FEET
SCALE

North

7/6/00

SOURCE: TRC, 1999

Mesquite Mine Expansion EIR/EIS

Locations of Borings and Wells

FIGURE 3.2-3

BRG CONSULTING, INC.

An important result of this series of hydrologic and geotechnical investigations conducted for the Mesquite Mine has been the definition of a minor ground water subbasin that underlies the general area of the mine site. The subbasin is defined by a zone where low-permeability conglomerate bedrock or basement rock is present at shallow depths (Figure 3.1-4), and water-bearing alluvium does not exist.

The southern boundary of the ground water subbasin is defined by a buried basement rock high that separates the project area from the main Amos-Ogilby alluvial basin to the south. The postulated limits of this subbasin are shown on Figure 3.2-2. The existing Mesquite Mine well field, which would be used to supply water for the expansion activities, is located about 1 mile south of the subbasin boundary and, therefore, taps into the deep alluvium of the Amos-Ogilby Basin. Table 3.2-1 shows these wells (GF-1, -2 and -3) have estimated maximum yields of 2,500 gallons per minute (gpm) each, compared to wells completed in the subbasin that yield less than 28 gpm. Figures 3.2-3 and 3.2-4 show the approximate locations of the wells listed in Table 3.2-1.

The ground water flow in the subbasin is generally from the northeast toward the southwest in the same direction as the surface ground slope. Prior to mining, ground water generally occurred at depths ranging from about 200 to 300 feet in the mine pit and ore processing areas. The source of ground water recharge to the subbasin underlying the Mesquite Mine area is the small amount of precipitation infiltration that occurs in the upgradient watershed bounded by the drainage divide of the Chocolate Mountains. Precipitation rates in the area are on the order of 3 inches per year, while lake evaporation potential is approximately 80 inches per year. As a result of the limited watershed and low precipitation, and the low permeability of ground water recharge is minimal. This condition is reflected in long-term water level data for the Mesquite Mine Monitoring Wells (GW-1 to -9). These wells generally have shown only very small water level fluctuations (i.e., typically less than 5 feet), including changes that were measured during the drought of the late 1980s and the September 1991 to May 1992 period when rainfall was more than twice the yearly average. An exception occurs at GW-7, located adjacent to the Big Chief and Vista pits, where draw down appears to be occurring due to seepage into the mine pits.

In contrast to the ground water subbasin conditions at the Mesquite Mine site, the thick, water-bearing alluvial deposits of the Amos-Ogilby Basin store and transmit substantial amounts of ground water. The Amos-Ogilby Basin is the source of ground water for the existing Mesquite Mine wells, located about 3 miles south of the mine site. The main source of recharge to these deposits is underground flow from the Colorado River and the All American Canal in the southeasternmost portion of the Imperial Valley (USGS, 1972 and 1975); however, the project area is not within an area that is considered in or part of the Colorado River system for purposes of water rights jurisdiction. Some recharge also is derived from infiltration of precipitation at the Algodones Sand Dunes and from relatively minor amounts from infiltration from the adjacent mountain slopes. The magnitude of total recharge is estimated to be on the order of 100,000 acre-feet per year, if the anticipated hydrogeologic connection between the Amos-Ogilby and East Mesa Basins exists. If this interbasin connection does not exist, the estimated recharge would be on the order of 50,000 acre-feet per year.

Table 3.2-1

Summary Of Vicinity Wells, Proposed Mesquite Mine Expansion

	Well Identification	Purpose	Rated Yield (Gpm)	Total Depth (Ft)	Perforated Interval (Ft)	Sealed Depth (Ft)	Dated Completed	Approximate Water Level (Ft)	
								Depth	Elevation
Wells Completed in Bedrock or Basement Rock of the Subbasin	WT-2	Production/ Upgradient Monitoring	28	442	154-404	N/A	October 1982	185	550
	SM-63	Production	10	477	N/A[1]	N/A	N/A	185	575
	SM-241		10	520				200	560
	Singer Well		15	470				220	575
	GW-1	Downgradient Monitoring Well	< 15	430	317-416	0-291	October 1985	313	277
	GW-2		< 10	310	207-305	0-190		270	360
	GW-3		1-2	310	196-296	0-193		213	437
	GW-4	Upgradient Monitor. Well	2	320	209-309	0-190	October 1986	223	502
	GW-5	Downgradient Monitoring Well	2	359	259-359	0-250	October 1988	270	N/A
	GW-6		1-2	338	238-338	0-222	January 1990	250	N/A
	GW-7	Upgradient Monitoring Well	--	ND[3]	ND	ND	May 1995	ND	544
	GW-8A		--	ND	423-522	ND	July 1997	260	555
	GW-9		--	500	374-473	ND	June 1997	287	568
	LGW-1	Downgradient Monitor.Well	< 10	450	300-450	0-285	February 1993	357	210
	LGW-2	Upgradient Monitor.Well	< 10	190	130-190	0-130	Nov. 1992	141	490
	MCR-80	(4)	< 26	1,017	402-1,002	0-50	March 1983	197	523
Wells Completed in Amos-Ogilby Basin Avenue	GF-1	Production		822	506-810	0-20	Dec. 1983	474	79
	GF-2		2,300+	908	658-885	0-50	March 1985	462	78
	GF-3A		2,250+	940	690-930	0-50	March 1986	469	77
	MBH-1	Observation	N/A	600	510-590	0-300	Nov. 1984	467	81
	MBH-2			640	510-590	0-400		470	80
	MBH-3			683	510-680	0-400		458	79
	Boardman Well	Production	N/A	735	N/A	N/A	Nov. 1980	309	95
	Glamis Well	Production	300	520	N/A	N/A	Nov. 1972	235	100
	Cahuilla Ranger Station	Production	50	300	210	N/A	July 1992	114	80[2]
	Gold Rock Ranch Well	Production	N/A	521	N/A	N/A	1935	397	83
	American Girl Mine 26-1	Production	50	N/A	N/A	N/A	N/A	280	119
	American Girl Mine 26-2	Production	400	393	N/A	N/A	August 1988	280	119

Source: Environmental Solutions, Inc., 1993.

[1] N/A = Not Available

[2] Estimated based on approximate ground surface of 195 feet above mean sea level.

3 ND Not Determined for this EIR/EIS

4 Intended for large-scale production, but insufficient yield.

gpm = gallons per minute ft = feet

Mine Pit Area Ground Water Occurrence

Prior to mining, ground water in the areas of the mine pits ranged in depth from about 200 to 300 feet. Mining in the Big Chief, Vista and Rainbow pits has extended downward to ground water, and dewatering at the mine pits has created localized cones of depression in the ground water near the pits (Figure 3.2-5). Dewatering in the mine pit area began in 1987 when the Big Chief pit reached the ground water level anticipated from prior observations at wells and exploratory borings.

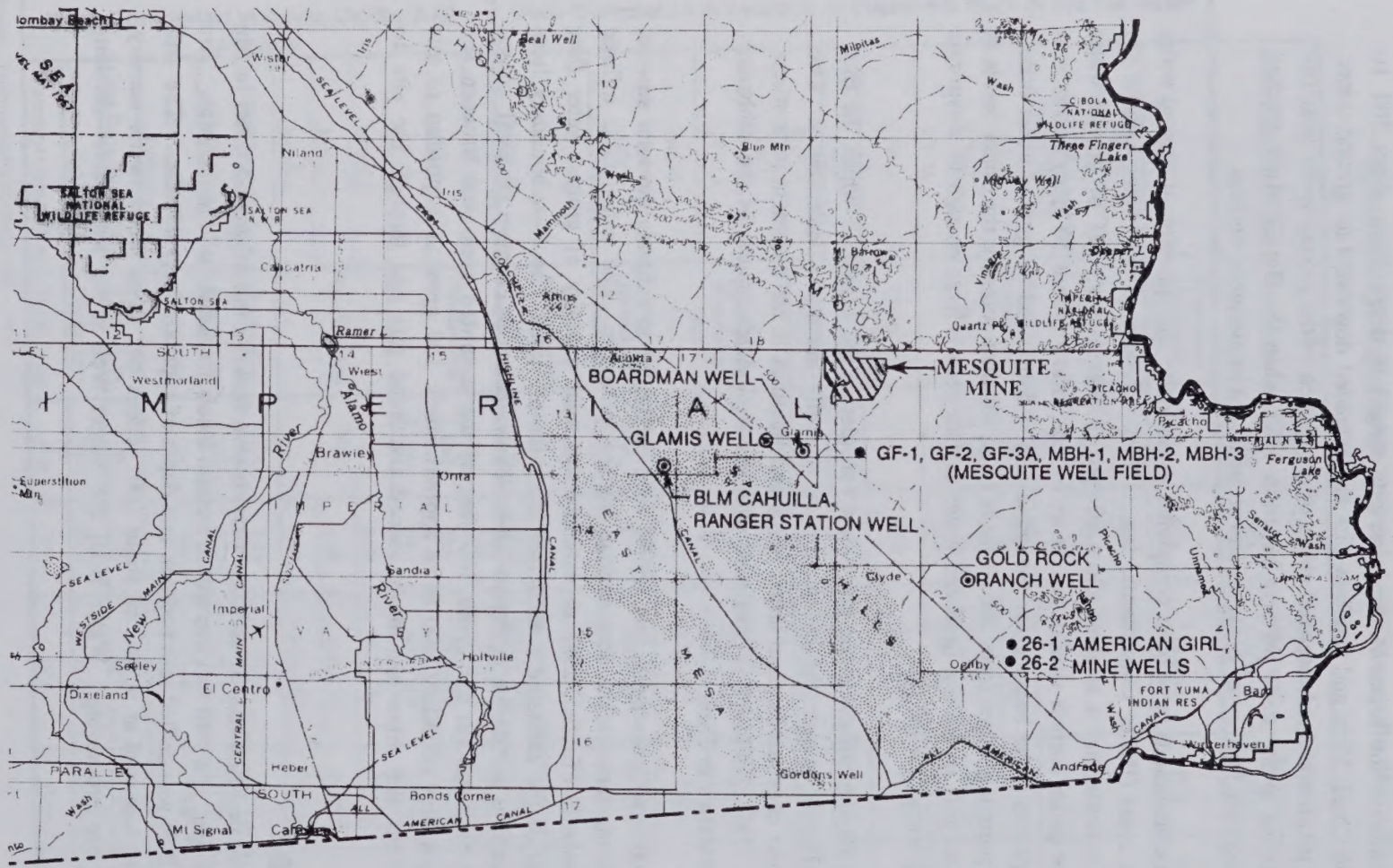
Flow net and water balance calculations have been completed to estimate the quantity of ground water flow through the mine pit areas (Baker Consultants, Inc., 1999). Results of the water balance are shown in Table 3.2-2 and indicate that a total of about 80 gpm (130 acre-feet/year) of ground water may flow into the mine pits under current conditions. Most of this inflow (about 50 gpm) occurs into the Big Chief pit. The long-term water balance for the mine pits is dominated by ground water inflow and evaporation. Without pumping water from the pit lakes (e.g., for dust control), the water levels in the currently permitted mine pits would rise until the water surface area is large enough to evaporate water at the same rate as it seeps into the pits.

The total estimated current 80 gpm inflow to the pits is low considering the extent to which the pits penetrate the water table. This is because the basement rock typically has a low permeability. The water seepage that does occur is primarily from larger joints and fractures in the basement rock where permeability is the highest. This conclusion is consistent with low well yields typical of the subbasin, as described previously and shown in Table 3.2-1.

The flow net calculations (Baker Consultants, Inc., 1999) were performed to estimate the total amount of ground water flow occurring through the area surrounding the mine pits. The calculations utilized the results of the water balance (Table 3.2-2) to estimate the total quantity of ground water flow through the upper 300 feet of the saturated zone across the mine pit areas. The flow boundary lines used for the flow net calculations are shown in Figure 3.2-5. The calculations estimate the total ground water inflow to the mine pit areas (in the upper 300 feet of the saturated zone and between the easternmost and westernmost flow boundary line) to be approximately 100 gpm. The portion of this flow that does not seep into the mine pits flows around the mine pits and through the site to downgradient areas.

3.2.3.2 Usage

With the exception of Mesquite Mine-related uses, the only known historic use of ground water in the subbasin was by Richard Singer, at a well that lies within a claim block previously sold to the mine. The Singer Well (See Figure 3.2-3) was drilled into bedrock to a depth of approximately 470 feet. The well produced about 15 gpm and was used at a rate of about 100 gallons per week for showers, laundry, cooling, and some minor ore processing. Water from the Singer Well is not suitable for drinking purposes.



LEGEND

⊙ LOW CAPACITY DOMESTIC WELLS

● HIGH CAPACITY INDUSTRIAL WELLS

0 10 20 MILES

SCALE

North

3/14/00

SOURCE: Env. Solutions, Inc., 1992

BRG CONSULTING, INC.

Mesquite Mine Expansion EIR/EIS

Locations of Area Wells

FIGURE 3.2-4



SOURCE: Baker Consultants, Inc, 1999.

BRG CONSULTING, INC.

Mesquite Mine Expansion EIR/EIS

Existing Groundwater Elevations

FIGURE 3.2-5

In addition to the Singer Well, the Mesquite Mine used ground water from the subbasin for a pilot test facility and exploration drilling from 1982 to 1986. This water was obtained from several low-capacity (10 to 28 gpm) wells completed in the bedrock or basement rock, identified as SM-63, SM-241 and WT-2 in Table 3.2-1 and in Figure 3.2-3.

Since early 1986, when full-scale operation of the Mesquite Mine began, water requirements have been supplied by the Mesquite Mine well field located approximately 3 miles south of the proposed site in alluvial deposits of the Amos-Ogilby Basin. The well field was located distant from the Mesquite Mine area because earlier attempts at developing large-scale production wells closer to the mine (i.e., in the subbasin area) were unsuccessful. The Mesquite Mine well field includes three large-diameter wells, large high-production pumps, two monitoring wells, a 5-mile electric power line, and a 4-mile above-ground pipeline.

The Mesquite Mine well field is approved for extracting up to 4,033 acre-feet of water per year (Imperial County CUP No. 684-84), based on maximum estimates of potential water demands for dust control, heap leaching and evaporation.

3.2.3.3 Aquifer Characteristics

Ground water in the subbasin that underlies the Mesquite Mine occurs primarily in two hydrogeologic units, basement rock and Bear Canyon Conglomerate. Hydraulic conductivities that have been estimated or measured in these units as part of site-specific ground water investigations are summarized in Table 3.2-3.

Based on data from pumping tests conducted on wells near the Mesquite mine pit, Sergent, Hauskins & Beckwith (1984) estimated the hydraulic conductivity of the basement rock within the Big Chief Mine Pit area to be less than 5×10^{-6} centimeters per second (cm/sec). Hydraulic tests conducted in Boring ESI-2 (See Figure 3.2-3) indicated that the hydraulic conductivity of the majority of the unfractured basement rock encountered in that boring is very low, on the order of 10^{-7} cm/sec. Based on exploration boring log reviews by Baker Consultants, Inc. (1999), Well GW-1 is thought to be screened in a basalt or andesite volcanic unit. The volcanic unit encountered in this well is hypothesized to be part of the Tertiary age volcanics of the basement rock as described in Section 3.1.3.3. Results of a pumping test at Well GW-1 (Environmental Solutions, Inc., 1993) indicate that the hydraulic conductivity of the volcanic unit at GW-1 is about 6×10^{-5} cm/sec. These results indicate a hydraulic conductivity that is an order of magnitude higher than the Pre-Tertiary igneous and metamorphic units of the basement rock (Table 3.2-3). Well GW-1 encountered the volcanic unit in the ore processing area, about two miles downgradient of the mine pits. This volcanic unit does not occur below the ground water table in the mine pit areas and does not directly affect ground water seepage or drawdown in the mine pit areas.

Table 3.2-2

Existing Pit Lake Water Balance Summary
Proposed Mesquite Mine Expansion

Pit Lake Name	Pumping[1] Q_{pump} (gpm)	Direct Precipitation Q_{DP} (gpm)	Evaporation Q_E (gpm)	Net Ground Water Inflow Q_{GW} (gpm) [2]
Big Chief	43	0.2	6.2	49
Rainbow	2	0.1	2.5	4.4
Vista				
East	7	0.1	2.5	9.4
West	0	0.1	2.8	2.7
Panhandle	0	0.4	10.9	11
Rubble Ridge	0	0.2	4.9	4.7
Vista Subtotal	--	--	--	28
TOTAL				**81.4**

99-116 (6/22/00/jb)

Source: Baker Consultants, Inc., 1999.

(1) e.g., Pit lake pumping for dust control.

(2) Derived using the following formula with rounding to two significant digits.
$Q_{GW} = Q_{pump} + Q_E - Q_{DP}$

Table 3.2-3

Summary Of Hydraulic Conductivity Estimates For The Subbasin Proposed Mesquite Mine Expansion

Hydrogeologic Unit	Estimated Hydraulic Conductivity		Reference
	cm/sec	ft/day	
Basement Rock (undifferentiated)	$<5 \times 10^{-6}$	1.5×10^{-2}	SHB, 1984a
	6.3×10^{-5} to 2.1×10^{-4} **1**	1.8×10^{-1} to 5.8×10^{-1} **1**	Environmental Solutions, Inc., 1993 (GW-1 Pump Test)
	$<1.67 \times 10^{-7}$ to 4.8×10^{-7}	$<4.7 \times 10^{-4}$ to 1.4×10^{-3}	Environmental Solutions, Inc., 1993 (ESI-2 Packer Test)
	8.1×10^{-6} to 2.0×10^{-5} (geometric mean 1.6×10^{-5})	2.3×10^{-2} to 5.6×10^{-2}	SMI, 1998a
Conglomerate	3.3×10^{-7} to 2.9×10^{-4} (average 10^{-6})	9.4×10^{-4} to 8.2×10^{-1}	Environmental Solutions, Inc., 1993 (ESI-2 Packer Test)
	2.1×10^{-6} to 1.2×10^{-4} (average 10^{-5})	6.0×10^{-3} to 3.4×10^{-1}	Environmental Solutions, Inc., 1993 (ESI-1 Packer Test)

99-116 (11/5/99/mc)

Source: TRC, 2000.

1 The lower end of this range (i.e., 6.3×10^{-5} cm/sec and 1.8×10^{-1} ft/day) were interpreted to represent the overall rock mass, whereas the higher end of this range (2.1×10^{-4} cm/sec and 5.8×10^{-1} ft/day) were interpreted to represent initial dewatering of fractures in rock adjacent to walls of the well boring.

cm/sec = centimeters per second
ft/day = feet per day

The results of packer pressure tests conducted in the cored Borings ESI-1 and ESI-2 indicate that the hydraulic conductivity within the top portion of the Bear Canyon Conglomerate varies from 8 x 10^{-5} cm/sec at shallow depths to less than 10^{-6} cm/sec at about 100 feet. Water has been encountered in the Bear Canyon Conglomerate primarily in the ore processing areas in the southern portion of the Mesquite Mine site. In the mine pit areas, located in the northern and central portions of the site, the Bear Canyon Conglomerate primarily occurs above ground water.

Hydraulic parameters for the main, alluvial portion of the Amos-Ogilby Basin were determined by pumping tests conducted when the Mesquite Mine well field was installed in 1983, 1985, and 1986. The estimated hydraulic conductivity of the sand and gravel portions of the alluvium aquifer determined for these tests is on the order 10^{-2} cm/sec, or three to four orders of magnitude greater than hydraulic properties of the subbasin that underlies the Mesquite Mine site. The alluvium aquifer does not occur beneath the mine site. It begins offsite to the south and west where thick accumulations of alluvium are present (Section 3.2.3.1).

3.2.3.4 Ground Water Quality

The quality of ground water in the vicinity of the Mesquite Mine has been described in several investigations conducted to support the EIR/EIS and Plan of Operation documents prepared for the VCR Mining Project, Mesquite Project, Mesquite Regional Landfill and Rainbow Pit Expansion (ESI, 1987; ESI, 1993, BRG, 1995; SMI, 1997). The typical ground water chemistry reported for the ground water subbasin in which the mine is located is shown in Table 3.2-4 (excerpted from ESI, 1993). The data in the table represent ground water quality conditions observed in various colluvial and bedrock hydrostratigraphic units for selected sampling events between 1982 and 1993.

The Mesquite Mine began operation in 1985. The locations of monitoring wells for which data is shown are provided in Figure 3.2-3, although WT-2, SM-63 and the Singer Well no longer exist. Ground water quality data for the Mine monitoring wells (i.e., the "GW" series wells) has been collected and routinely reported to the RWQCB throughout the 15 years that Mesquite has been operating. Under current mine operation permit requirements, ground water quality is monitored on a quarterly basis in wells GW-1 through GW-7 for the following chemical constituents: pH, specific conductance, temperature, arsenic, copper, cyanide (total), cyanide (free), iron, nitrate/nitrite, silver, sulfate and TDS.

Work by Baker Consultants, Inc. (1999) included detailed review of the last 5 years of monitoring data from Wells GW-1 through GW-6 for most of these monitoring parameters. Trends were evaluated for the parameters of pH, specific conductance, temperature, TDS, arsenic, copper, iron, sulfate and nitrate/nitrite. A complete listing of data evaluated and graphical representations of the data are included in the Baker report. None of the parameters evaluated show trends of adverse change in water quality. There are no known ground water quality impacts from the 15 years of activity that have occurred at the Mesquite Mine to date.

Table 3.2-4

Selected Water Quality Data
Proposed Mesquite Mine Expansion

Parameter And Drinking Water Standard [1]		pH (units)	SC (µmho/cm)	TDS (mg/L)	Cl^- (mg/L)	F^{-2} (mg/L)	SO_4^{-2} (mg/L)	As[3] (mg/L)	Cr[3] (mg/L)	Fe[3] (mg/L)	Mn[3] (mg/L)	Hg (mg/L)
		6.5-8.5	900*	500*	250*	1.6[2]	250*	0.05	0.05	0.30*	0.05*	0.002
Well[4]	Date											
WT-2	11/22/82	7.88	1,650[4]	1,000	142	2.5	262	0.05	<0.01	0.80	0.08	NA
	3/21/83	7.23	1,760	1,004	137	3.1	274	0.014	<0.01	0.56	0.03	NA
	2/4/84	8.0	1,660	996	127	1.6	256	0.031	<0.01	0.03	<0.01	NA
	5/4/84	8.4	1,800	997	146	1.32	251	NA	NA	NA	NA	NA
	1/21/85	8.2	NA	1,040	136	NA	256	NA	NA	NA	NA	NA
	10/25/85	7.99	1,630	969	140	1.71	260	0.003	<0.01	0.07	0.07	NA
	12/12/85	8.36	1,561	938	110	1.58	266	0.026	<0.01	0.2	0.01	NA
SM-63	11/22/82	7.61	1,560	960	125	1.3	280	0.01	<0.01	0.12	0.01	NA
	3/21/83	7.14	1,650	992	104	3.3	274	0.014	<0.01	1.00	0.02	NA
Singer	2/4/84	7.85	2,250	1,328	286	1.6	415	0.005	<0.01	0.82	0.06	NA
GW-1	10/25/85	7.34	3,320	2,128	595	1.5	283	0.007	0.08	33	14	NA
	12/12/85	7.52	3,105	2,032	486	1.09	168	0.037	0.14	22	1.7	NA
	10/28/86	8.25	3,081	1,819	660	2.2	360	0.075	0.04	3.5	4.1	NA
	4/92	7.5	NA	1,802	NA	NA	NA	NA	NA	NA	NA	NA
	12/93	7.1	NA	1,943	NA	NA	NA	NA	NA	NA	NA	NA
GW-2	10/25/85	7.35	3,230	1,960	876	1.7	325	0.001	<0.01	0.19	0.84	NA
	12/12/85	7.75	3,485	1,992	863	1.02	330	0.007	<0.01	0.77	0.5	NA
	4/92	7.7	NA	1,645	NA	NA	NA	NA	NA	NA	NA	NA
	12/93	8.3	NA	2,003	NA	NA	NA	NA	NA	NA	NA	NA
GW-3	10/25/85	7.92	1,221	869	129	1.3	297	0.002	<0.01	0.04	0.04	NA
	12/12/85	7.23	1,346	890	134	1.81	292	0.017	<0.01	0.39	0.11	NA
	4/92	7.7	NA	1,136	NA	NA	NA	NA	NA	NA	NA	NA
	12/93	7.8	NA	837	NA	NA	NA	NA	NA	NA	NA	NA
GW-4	10/23/86	8.14	2,027	1,270	309	2.0	342	0.009	0.03	0.04	0.14	0.0009
	4/92	7.7	NA	1,191	NA	NA	NA	NA	NA	NA	NA	NA
	12/93	7.7	NA	1,255	NA	NA	NA	NA	NA	NA	NA	NA
GW-5	6/7/89	8.4	NA	1,170	302	2.5	229	0.071	0.20	0.03	1.6	<0.0005
	4/92	9.2	NA	1,191	NA	NA	NA	NA	NA	NA	NA	NA
	12/93	7.7	NA	1,255	NA	NA	NA	NA	NA	NA	NA	NA
GW-6	7/30/91	8.0	NA	1,273	430	1.2	300	<0.005	<0.005	32	0.21	<0.0001
	12/93	7.5	NA	1,495	NA	NA	NA	NA	NA	NA	NA	NA
MCR 80	1/18/85	7.28	3,306	1,800	609	NA	425	NA	NA	6.8	NA	NA

99-116 (6/22/00)(jb)

Source: Environmental Solutions, Inc., 1993.

(1) California Domestic Water Quality and Monitoring Regulations. California Health and Safety Code and the CAC Title 22.
(2) 1.6 mg/L based on annual average air temperature of 73° F.
(3) Data presented as total (mg/L). Soluble (<0.45 µm) level data also available.
(4) Well locations are shown in Figure 3.2-3.
(5) The highlighted - dot-screened - numbers exceed drinking water standards.

* Recommended secondary drinking water standard. Upper and short-term levels may be higher.

N/A = Not Applicable
µmhos/cm = micromhos per centimeter mg/L = milligrams per liter

Because routine monitoring is specifically directed at specific constituents of interest, it does not include enough parameters to allow a cation/anion chemical charge balance. Recent studies (Baker Consultants, Inc, 1999) have included water sampling and analysis for a more extensive set of parameters. The results of these analyses are provided in Table 3.2-4. The wells sampled and analyzed represent both the basement rock (GW-4, GW-8A and GW-9) and the Bear Canyon Conglomerate (Wells GW-2, GW-3, GW-5 and GW-6) water-bearing units that occur in the subbasin. Work by Baker Consultants, Inc. (1999) indicates that Well GW-1 is screened in an andesite or basalt unit. Data for Well GW-7 is not included in Table 3.2-5, because the Baker Consultants, Inc., study did not determine the unit in which Well GW-7 is screened. This does not materially affect the environmental analysis due to the extensive amount of other ground water data available.

Ground water quality data has been collected from wells in the subbasin over a period of more than 17 years, including prior to mining. Data consistently show that the ground water in the subbasin is sodium-chloride/sulfate in character, and is of generally poor quality and unsuitable for drinking without treatment. It is naturally brackish and moderately to slightly alkaline. Concentrations of total dissolved solids range from about 800 to about 2,000 mg/L. Major dissolved species include sodium, calcium, magnesium, chloride, sulfate, bicarbonate and silica. Minor species include potassium, boron and fluoride. Table 3.2-6 provides a listing of certain State Water Quality Goals to provide a basis of comparison for the constituent concentrations characteristic of ground water in the subbasin.

The water quality commonly exceeds the primary drinking water standard for fluoride and secondary drinking water standards for specific conductance, total dissolved solids, chloride and sulfate. Agricultural water quality standards are also exceeded for boron, chloride and total dissolved solids. Other standards are also exceeded on occasion or in a limited number of wells. These dissolved constituent concentrations are natural and limit the potential beneficial uses of this water without treatment.

3.2.3.5 Pit Water Quality

The Mesquite mine pits currently extend into ground water. Water seeps into the pits and is evaporated or pumped and used for dust control. To the extent that seepage exceeds these uses, ground water ponds in the bottoms of the pits. The chemical composition of waters in four of the existing pit lakes has been monitored during five sampling events conducted between December 1997 and July 1999. During this period, lake depths have varied from approximately 3 to 4 feet to approximately 7 to 10 feet as a result of ground water inflows, mine pit dewatering activities and lake surface evaporation. A complete tabulation of water quality data available for the lakes is presented in Baker Consultants, Inc. (1999).

The mean water quality observed in the Big Chief lake, Vista West lake, Vista East lake and Rainbow lake is summarized in Table 3.2-7. The concentrations of chemical constituents reported in the table represent the geometric means of the eight water samples analyzed to date. Existing pit lake waters are generally alkaline, slightly to moderately saline and low in dissolved trace metals considering the context of mine pit lakes in a highly evaporative climate.

Table 3.2-5

Ground Water Chemistry
Proposed Mesquite Mine Expansion

Parameter	Concentration (mg/L except where noted)							
	GW-1	GW-2	GW-3	GW-4	GW-5	GW-6	GW-8A	GW-9
Date Collected	7/19/99	7/19/99	7/20/99	7/20/99	7/19/99	7/19/99	8/26/97	7/19/97
pH(1)	7.73	8.01	8.07	8.16	8.18	9.38	7.94	8.13
Specific Conductance(2)	2,760	3,000	1,330	1,890	1, 750	2,060	--	--
Alkalinity (Total)(3)	140	64.3	239	224	198	44.7	212	248
Aluminum	0.082	0.121	<0.037	0.051	<0.037	<0.037	<0.037	<0.037
Antimony	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.0015	<0.003
Ammonia (as N)	0.25	0.15	<0.01	<0.01	<0.01	<0.01	--	--
Arsenic	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Barium	0.056	0.033	0.019	0.012	0.031	0.013	0.055	0.012
Beryllium	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Bismuth	--	--	--	--	--	--	<0.027	<0.027
Boron	1.67	1.71	1.17	1.27	1.15	1.61	1.12	1.18
Cadmium	<0.0024	<0.0024	<0.0024	<0.0024	<0.0024	<0.0024	<0.0024	<0.0024
Calcium	76.9	131	24.6	37.2	42.3	19.5	32.7	15.7
Chloride	633	846	137	288	297	479	336	177
Chromium	<0.005	<0.005	0.012	<0.005	<0.005	<0.005	<0.005	0.01
Cobalt	--	--	--	--	--	--	<0.003	<0.003
Copper	<0.004	<0.04	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Cyanide (Total)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cyanide (WAD)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Fluoride	1.5	0.50	2.0	2.0	2.6	1.1	1.7	1.6
Gallium	--	--	--	--	--	--	<0.033	<0.033
Iron	0.03	<0.02	<0.02	0.03	<0.02	<0.02	<0.02	<0.02
Lead	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	< 0.003
Lithium	0.050	0.12	0.055	0.054	0.061	0.087	0.055	0.073
Magnesium	11.1	5.08	5.23	10.6	8.34	9.1	6.69	6.09
Manganese	0.832	0.018	<0.002	0.008	0.006	0.004	0.108	<0.002
Mercury	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	0.069	0.033	0.026	0.062	0.058	0.027	0.061	0.036
Nickel	<0.023	<0.023	<0.023	<0.023	<0.023	<0.023	<0.023	<0.023
Nitrate/Nitrite (as N)	0.12	2.38	0.025	0.78	1.55	0.09	0.75	0.48
Orthophosphate (as P)	<0.13	2.85	<0.13	<0.13	<0.13	<0.13	<0.13	0.13
Potassium	4.6	5.8	3.4	4.8	6.6	5.4	5.1	3.8
Scandium	--	--	--	--	--	--	<0.002	<0.002
Selenium	<0.048	<0.048	<0.048	<0.048	<0.048	<0.048	<0.048	<0.048
Silica	25.5	17.3	29.3	26.6	24.3	5.84	23.6	27.1
Silver	<0.006	0.007	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
Sodium	557	567	260	372	416	435	417	305
Strontium	1.90	2.75	0.437	0.791	1.06	0.622	0.881	0.364
Sulfate	439	325	270	386	321	348	346	226
Thallium	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Tin	<0.05	0.06	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Titanium	<0.007	<0.007	<0.007	<0.007	0.04	0.02	<0.007	<0.007
Total Dissolved solids	1,630	1,740	801	1,180	1,050	1,160	1,290	866
Total Suspended Soils	6	615	3.6	16.2	58.8	339	2.5	1.4
Vanadium	0.012	<0.007	0.045	<0.007	0.017	0.009	<0.007	<0.007
Zinc	0.665	0.59	0.124	0.163	0.311	0.069	0.688	0.375

99-116 (6/21/00/mc)

Source: Baker Consultants, Inc., 1999.

(1) Standard Units, (2) Micromhos per centimeter, (3) mg/L $CaCO_3$ = milligrams per liter of calcium carbonate

Table 3.2-6

California Water Quality Goals
Proposed Mesquite Mine Expansion

Parameter	Primary Mcl[1]	Secondary Mcl[1]	Agricultural Water Quality Goal (Units In Mg/L Except Where Noted)	Ambient Aquatic 4 Day Average	Ambient Aquatic 1 Hour Average
Aluminum	1	0.2	5	0.087	0.75
Ammonia (as N)	--	--	--	pH, temp dependent	pH, temp dependent
Antimony	0.006	--	--	0.03	0.088
Arsenic	0.05	--	0.1	0.19	0.36
Barium	1	--	--	--	--
Beryllium	0.004	--	0.1	--	--
Boron	--	--	0.70/0.75[2]	--	--
Cadmium	0.005	--	0.01	0.0019[3]	0.0091[3]
Chloride	--	250	106	230	860
Chromium (Total)	0.05	--	--	--	--
Cobalt	--	--	0.05	--	--
Copper	1.3[4]	1	0.2	0.023[3]	0.037[3]
Cyanide (Total)	0.2	--	--	0.0052	0.022
Fluoride	1.4 - 2.4[5]	--	1	--	--
Iron	--	0.3	5	--	--
Lead	0.012[4]	--	5	0.0062[3]	0.16[3]
Manganese	--	0.05	0.2	--	--
Mercury	0.002	--	--	0.000012[6]	<0.0021[7]

Table 3.2-6

California Water Quality Goals
Proposed Mesquite Mine Expansion

Parameter	Primary Mcl[1]	Secondary Mcl[1]	Agricultural Water Quality Goal (Units In Mg/L Except Where Noted)	Ambient Aquatic 4 Day Average	Ambient Aquatic 1 Hour Average
Molybdenum	--	--	0.01	--	--
Nickel	0.1	--	0.2	0.32[3]	2.90[3]
Nitrate (as N)	10/45[8]	--	--	--	--
Nitrite (as N)	1	--	--	--	--
Nitrate plus Nitrite (as N)	10	--	--	--	--
pH	--	6.5-8.5 units	--	--	--
Selenium	0.02	--	0.02	--	--
Silver	--	0.1	--	0.00019[7]	0.0014[7]
Sulfate	--	250/500[9]	--	--	--
Thallium	0.002	--	--	--	--
Total Dissolved Solids	--	500/1,000[9]	450	--	--
Vanadium	--	--	0.1	--	--
Zinc	--	5	2	0.21[3]	0.23[3]

99-116 (6/21/00/mc)

Source: Baker Consultants, Inc., 1999.

(1) California Department of Health Services Maximum Contaminant Level (MCL).
(2) U.S. Environmental Protection Agency, Quality Criteria for Water, 1986 (May 1986) (The Gold Book) plus updates.
(3) Based on hardness of 230 mg/L measured in Big Chief Lake.
(4) MCL includes this "Action Level" to be exceeded in no more than 10 percent of samples at the tap.
(5) MCL varies with air temperature.
(6) Expressed as total recoverable.
(7) Expressed as dissolved.
(8) Expressed as NO_3.
(9) Second value is the upper level recommended by the California Department of Health Services.

The pH values range between 8.3 and 8.9, and the waters have a relatively high buffering capacity as indicated by total alkalinity concentrations ranging from 258 to 334 mg/L of $CaCO_3$. The concentration of total dissolved solids in the lakes ranged from 1,400 to 3,600 mg/L, with the highest TDS in the Vista West pit lake. The Vista West pit lake chemistry shown represents a single sample collected when the lake was very shallow and concentrated by evaporation. As expected, the general chemical signature of the pit lake water is similar to the ground water that seeps into the pits, with major dissolved constituents including sodium, calcium, magnesium, chloride, sulfate, bicarbonate and silica.

Drinking water and irrigation standards in Table 3.2-6 are not applicable to the lakes that will occur in the mine pites. However, the following comparison is made to show that the quality of water in the existing pit lakes will not be suitable for these uses without treatment. A comparison of Tables 3.2-6 and 3.2-7 shows that in one or more of the existing pit lakes, the mean of available water quality data exceeds the primary MCL for antimony, fluoride, nitrate/nitrite (as N) and selenium. Secondary MCLs are exceeded in one or more pit lakes for boron, chloride, sulfate and TDS. Aquatic standards are exceeded for aluminum and chloride.

Without the Proposed Action, pumping of water from the pit lakes (e.g., for dust control), would cease and the water levels in the existing pits would rise until the water surface area is large enough to evaporate water at the same rate as it seeps into the pits.

Table 3.2-7

Existing Pit Lake Water Quality
Proposed Mesquite Mine Expansion

Parameter	Concentration [1] (Mg/L Except Where Noted)			
	Big Chief	Vista West	Vista East	Rainbow
pH [2]	8.30	8.66	8.30	8.92
Specific Conductance [3]	2,073	6,580	2,550	3,250
Alkalinity (Total) [4]	262	266	258	334
Aluminum	<0.031	<0.031	0.034	0.122
Ammonia (as N)	<0.01	<0.01	<0.01	<0.01
Antimony	<0.002	0.005	0.002	0.019
Arsenic	0.0081	0.012	0.0096	0.045
Barium	0.021	<0.003	0.019	0.007
Beryllium	<0.002	<0.002	<0.002	<0.002
Bismuth	<0.027	--	<0.027	<0.027
Boron	1.58	4.30	1.52	3.01
Cadmium	0.002	<0.002	0.002	<0.002
Calcium	44.3	57.6	40.7	12.6
Chloride	271	1,110	327	447
Chromium	<0.008	<0.008	0.006	<0.008
Cobalt	<0.003	--	<0.003	<0.003
Copper	<0.006	0.003	<0.006	<0.006
Cyanide (Total)	<0.01	0.02	<0.01	<0.01
Cyanide (WAD)	<0.01	<0.01	<0.01	<0.03
Fluoride	1.0	2.3	1.5	3.5
Gallium	<0.033	--	<0.033	<0.033
Iron	<0.02	<0.02	0.029	0.048
Lead	<0.003	<0.003	<0.003	<0.003
Lithium	0.062	--	0.063	0.168
Magnesium	26.3	56.3	19.1	11.6
Manganese	0.003	<0.003	<0.003	0.003
Mercury	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	0.043	0.156	0.038	0.167
Nickel	<0.023	<0.023	0.019	<0.023
Nitrate/Nitrite (as N)	2.64	18.7	1.16	0.22
Orthophosphate (as P)	0.008	0.030	0.020	0.036
Potassium	10.4	--	8.5	10.8
Scandium	<0.002	--	<0.002	<0.002
Selenium	0.020	0.083	0.010	0.022
Silica	19.9	19.6	19.0	22.7
Silver	<0.007	<0.007	<0.0007	<0.007
Sodium	472	1,441	482	732
Strontium	1.32	2.85	1.05	0.360
Sulfate	572	1,750	600	731

Table 3.2-7

Existing Pit Lake Water Quality
Proposed Mesquite Mine Expansion

Parameter	Concentration [1] (Mg/L Except Where Noted)			
	Big Chief	Vista West	Vista East	Rainbow
Thallium	<0.003	<0.003	<0.003	<0.003
Tin	0.05	<0.01	0.05	<0.01
Titanium	<0.011	<0.011	<0.011	<0.011
Total Dissolved Solids	1,422	3,630	1,535	1,992
Total Suspended Solids	7.5	147	8.4	20.8
Vanadium	<0.007	<0.006	<0.007	<0.007
Zinc	<0.007	<0.007	0.004	<0.007

Source: Baker Consultants, Inc., 1999.

[1] The geometric mean was calculated for all constituents except pH where the arithmetic mean was used. Values below detection were calculated at one-half the detection limit.
[2] Standard Units
[3] Micromhos per centimeters
[4] mg/L $CaCO_3$ = milligrams per liter of calcium carbonate

3.3 BIOLOGICAL RESOURCES

3.3.1 Affected Environment

This section is based on a biological resource report prepared by Nevada Environmental Consultants Inc. (NECI) for the proposed expansion. The NECI report (2000) identifies and summarizes the possible biological impacts, including impacts to threatened, endangered, and sensitive species, based on a review of existing data, site-specific field surveys, and consultation with federal and state resource agencies, the Mesquite Mine, and the Imperial County Planning/Building Department. Several inventories and impact evaluations have also been completed specifically for the desert tortoise (*Gopherus agassizii*), which is a federally-listed threatened species. Desert tortoise surveys were conducted at the proposed expansion sites.

3.3.1.1 Scope and Regulatory Status

The proposed expansion areas are currently public and private land, under the jurisdiction of the BLM or the State of California, depending on location, and are governed by Federal and State laws protecting vegetation and wildlife. These include the Federal Endangered Species Act of 1973 (ESA), as amended, the California Endangered Species Act (CESA) of 1984 and the California Native Plant Protection Act of 1977. There are also several resource databases or lists, management plans and policies that apply to the proposed expansion. The following summarizes those that are pertinent to the proposed expansion.

Federal and State Legislation

Threatened and endangered species are protected under the provisions of the Endangered Species Act of 1973 (ESA), as amended, as well as the California Endangered Species Act (CESA) of 1984 and the California Native Plant Protection Act of 1977.

Federal Endangered Species Act

The federal Endangered Species Act of 1973 (ESA), as amended, extends legal protection to plants and animals listed as endangered or threatened by the U.S. Fish and Wildlife Service (USFWS). The ESA authorizes the USFWS to review proposed federal actions to assess potential impacts to listed species.

Listed species are those that are threatened or endangered (in danger of extinction throughout all or a significant portion of their range) and have been the subject of final regulation and listing in the Federal Register. Those species officially proposed for listing in a Federal Register notice are also represented.

Through Section 7 of the ESA, federal agencies, in consultation with the USFWS, are required to ensure "that any action authorized, funded, or carried out by [a federal] agency... is not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse

modification of [critical] habitat." Any action taking place on the property while under BLM or State jurisdiction that involves the potential take of a federally-listed species would require Section 7 consultation with the USFWS prior to the action taking place.

Executive Order 11990, Protection of Wetlands, May 24, 1977

Executive Order 11990 directs that each federal agency shall provide leadership and shall take action to minimize the destruction, loss or degradation of wetlands in carrying out the agency's responsibilities for (1) acquiring, managing, and disposing of federal lands and facilities; and (2) providing federally undertaken, financed, or assisted construction and improvement; and (3) conducting federal activities and programs affecting land use, including but not limited to water and related land resources planning, regulating, and licensing activities.

Federal Clean Water Act

Pursuant to Section 404 of the Clean Water Act (33 U.S.C. 1344), an Individual or Nationwide Permit is required when a proposed project will cause the obstruction or alteration of "navigable waters" of the U.S. The term "waters of the United States" has a broad meaning and incorporates both deep water aquatic habitats and special aquatic sites, including wetlands, as follows:

- The territorial seas with respect to the discharge of fill material.
- Coastal and inland waters, lakes, rivers, and streams that are navigable waters of the United States, including their adjacent wetlands.
- Tributaries to navigable waters of the United States, including adjacent wetlands.
- Interstate waters and their tributaries, including adjacent wetlands.
- All other waters of the United States not identified above, such as isolated wetlands and lakes, intermittent streams, prairie potholes, and other waters that are not a part of a tributary system to interstate waters or navigable waters of the United States to which the degradation or destruction could affect interstate commerce.

The US Army Corps of Engineers typically considers USGS 7.5 - minute quadrangle map "blue line" drainages as jurisdictional waters. Section 404 of the Clean Water Act authorizes the Secretary of the Army, acting through the Chief of Engineers, to issue permits for the discharge of dredged or fill material into the waters of the United States, including wetlands, provided that the applicant demonstrates that the project design is the least damaging practicable alternative.

BLM Sensitive Species List

"Sensitive" plant and wildlife species are designated by BLM's California State Director if they meet one or more of the following criteria:

- Plant and wildlife species identified as candidates for listing as endangered or threatened by the USFWS in a Federal Register Notice of Review.

- Plant and wildlife species that have been officially proposed for listing as endangered or threatened by the USFWS in a Federal Register Notice.

- Plant and wildlife species that do not meet either of the above criteria, but have been designated as sensitive by the State Director, based in part on information from the NDDB and private groups, such as the California Native Plant Society (CNPS).

The purpose of the designation is to provide increased management attention to prevent population and habitat declines that might result in federal or state listing as endangered or threatened.

California Endangered Species Act and Native Plant Protection Act

The California Endangered Species Act (CESA) of 1984 and the California Native Plant Protection Act (NPPA) of 1977 are administered by the CDFG. In addition to rare and endangered species, the State of California includes candidate species for plants and wildlife. Candidate species are those that have been accepted by the state for review and potential inclusion to the list of rare, threatened, or endangered species. The rare designation applies to plants only and includes those plants that are not threatened or endangered, but that could become eligible because of decreasing numbers or further restrictions to habitat.

California Department of Fish & Game Sections 1600 et. seq

Pursuant to Sections 1600-1607 of the California Fish & Game Code, a Streambed Alteration Agreement is necessary if there is to be any modification to a streambed due to construction activities. Substantial changes to natural drainage channels require a streambed alteration agreement from the California Department of Fish and Game under Section 1603 of the State Fish and Game Code. To obtain permits and/or agreements, the applicant must demonstrate that their Proposed Action is the least damaging practicable alternative.

California Department of Fish and Game Deer Herd Action Plan

The California Department of Fish and Game (CDFG) has designated the area surrounding the Mesquite Mine as the D-12 deer zone and has prepared a Deer Herd Action Plan (DHAP) for this area (1995). The D-12 DHAP addresses deer herds found in the vicinity of the existing mine and proposed expansion areas. Although this plan deals primarily with issues relating to hunting, it is an official management plan dealing with the specific issues relating to deer herds in this region and, therefore, the overall management policies are applicable to the proposed action.

Although no genetic evidence supports a differentiation, the mule deer in the area of the Mesquite Mine are referred to by the CDFG as burro deer based on subtle differences in coloration and size. There are no other deer species or subspecies found in this region. The burro deer fall within the CDFG D-12 deer zone. Local deer hunters recognize the D-12 deer zone as providing high-quality

hunting opportunities. In recent years, increased interest has resulted in more sportsmen from throughout the state applying to hunt there. The stated objectives of the D-12 DHAP are as follows:

1. Provide a reliable and repeatable method for determining deer herd population dynamics on a regular basis,

2. Accurately determine annual levels of deer harvest within the D-12 deer zone and develop monitoring programs to assess harvest impacts to the herd,

3. Conduct short- and long-term investigations to provide deer herd habitat and population data to effectively manage the burro deer herd,

4. Provide an effective method of identifying key deer habitat; predict, monitor, and mitigate impacts; and develop enhancement and protection projects, and

5. Provide a forum for the open exchange of deer herd management data and objectives between members of the Department and interested local, state, and Federal agencies and the public.

California Natural Diversity Data Base

The CDFG Natural Diversity Data Base (NDDB) is a computerized inventory of information on the general location and condition of California's rare and threatened animals, plants, and natural communities. The species inventoried by the NDDB are officially listed (state and federal) endangered, rare, and threatened animals and plants, plus those considered by the scientific community to be deserving of such listing. Sensitive species proposed for federal listing or candidate species are also identified by NDDB. Although the inventory does not include other more common animals and plants, such as those that may be important for game, commercial, or aesthetic reasons, such species are of concern and NEPA/CEQA requires that they also be considered in an environmental assessment of any non-exempt project. The NDDB does not contain information for every project location (only reported sightings); therefore, site specific surveys have been conducted for special-interest species expected to occur in the vicinity of the proposed Mesquite Mine expansion site and offered exchange parcels.

California Native Plant Society

The California Native Plant Society (CNPS) has created four lists to categorize degrees of concern for rare, threatened, and endangered plants of California. Inclusion on the CNPS lists does not accord legal protection to any species of plant or animal. These lists may be described as follows:

List 1A. This list includes plants that are presumed by CNPS to be extinct in California. CNPS asserts that all of the plants constituting List 1A meet the definitions of Section 1901, Chapter 10 (NPPA) of the California Department of Fish and Game Code, and these species are presumed by CNPS to be eligible for state listing.

List 1B. This list includes plants that are considered by CNPS to be rare, threatened or endangered in California and elsewhere. CNPS asserts that all of the plants constituting List 1B meet the definitions of Section 1901, Chapter 10 (NPPA) of the California Department of Fish and Game Code, and these species are presumed by CNPS to be eligible for state listing.

List 2. This list includes plants that are considered by CNPS to be rare, threatened, or endangered in California, but more common elsewhere. CNPS asserts that all of the plants constituting List 2 meet the definitions of Section 1901, Chapter 10 (NPPA) of the California Department of Fish and Game Code, and these species are presumed to be eligible for state listing by CNPS.

List 3. This list includes plants about which more information is needed. Necessary information about these plants is currently lacking. The plants that comprise List 3 are an assemblage of taxa that have been transferred from other lists or that have been suggested by CNPS for consideration. When the necessary information is collected, these plants would be assigned by CNPS to the proper lists or rejected.

List 4. This list includes plants that are considered by CNPS to be of limited distribution (a watch list). CNPS asserts that the plants in this category are of limited distribution in California and their vulnerability or susceptibility to threat appears low at this time. While these plants are not considered by CNPS to be rare from a statewide perspective (as in Lists 1 and 2), they are uncommon enough that their status should be monitored regularly.

3.3.1.2 Vegetation

Vegetation in the mine area reflects the arid conditions, limited rainfall and generally poor soils of the Sonoran Desert. The average annual temperature of the region is 74 degrees Fahrenheit (° F), with average highs of 105° to 110° F during the summer months, and average lows of 40° to 45° F during the winter months. Overall, temperatures range from about 30° F to about 120° F. Annual precipitation averages 3 inches, but varies greatly from year to year. The rainy season generally begins in July and ends in January.

Peak blooming season for desert vegetation typically occurs during the months of February, March, and April, when the general existing conditions survey was conducted. Runoff from occasional precipitation flows via small ephemeral drainages, or washes, that traverse the area. The desert washes are normally dry, with precipitation runoff occurring only during the occasional thunderstorms that bring precipitation to the region. Drainages generally originate in the Chocolate Mountains north of the project site and drain to the southwest where they either percolate into the shallow, wash-bottom soils, or terminate at the Imperial Sand Dunes Recreation Area (ISDRA).

The site is dominated by generally open areas and widely scattered vegetation. Sparse vegetation also is observed in the drainages. The low vegetation density reflects both the low moisture infiltration characteristics of the desert pavement and the low nutrient values and high salt levels of the generally poorly developed soils.

Plant species vary depending upon their location in washes or upland areas. Elevation also plays a local role in species distribution. Vegetation at and surrounding the mine exhibit a range of vegetation types within the Eastern Colorado Desert Creosote bush series. The project site supports three native plant communities: desert microphyll woodland (in the dry washes); creosote/desert pavement scrub (in dry washes and desert pavement areas); and, upland succulent scrub (hilly higher elevation areas onsite). Figure 3.3-1 shows the general habitat communities in the vicinity of the proposed expansion areas. A brief description of these habitats is provided below.

Microphyll Woodland

Microphyll woodland habitat is a sensitive desert plant community characterized by blue palo verde (*Cercidium floridum)*, ironwood (*Olneya tesota*) and smoke tree (*Psorothamnus spinosa*) being the dominant vegetation in canopy. These trees form mixed or single species stands in Colorado Desert washes. Microphyll woodland is a plant community that plays a valuable role in the Southwestern desert ecosystem. This community is typically found in sandy washes and forms mixed and single species stands throughout the Colorado Desert eco-region. This plant community prefers soils that are intermittently flooded.

For purposes of quantification, a stand of microphyll woodland consists of one or more of these species spaced within 100 meters of each other. The stands of microphyll woodland in the project area exhibited a patchy distribution and ranged from single tree stands to stands of 15 to 20 trees. Within the project area, this vegetation series occurs only in the washes and is dominated by blue palo verde and ironwood; these fall under the blue palo verde - ironwood - smoke tree series.

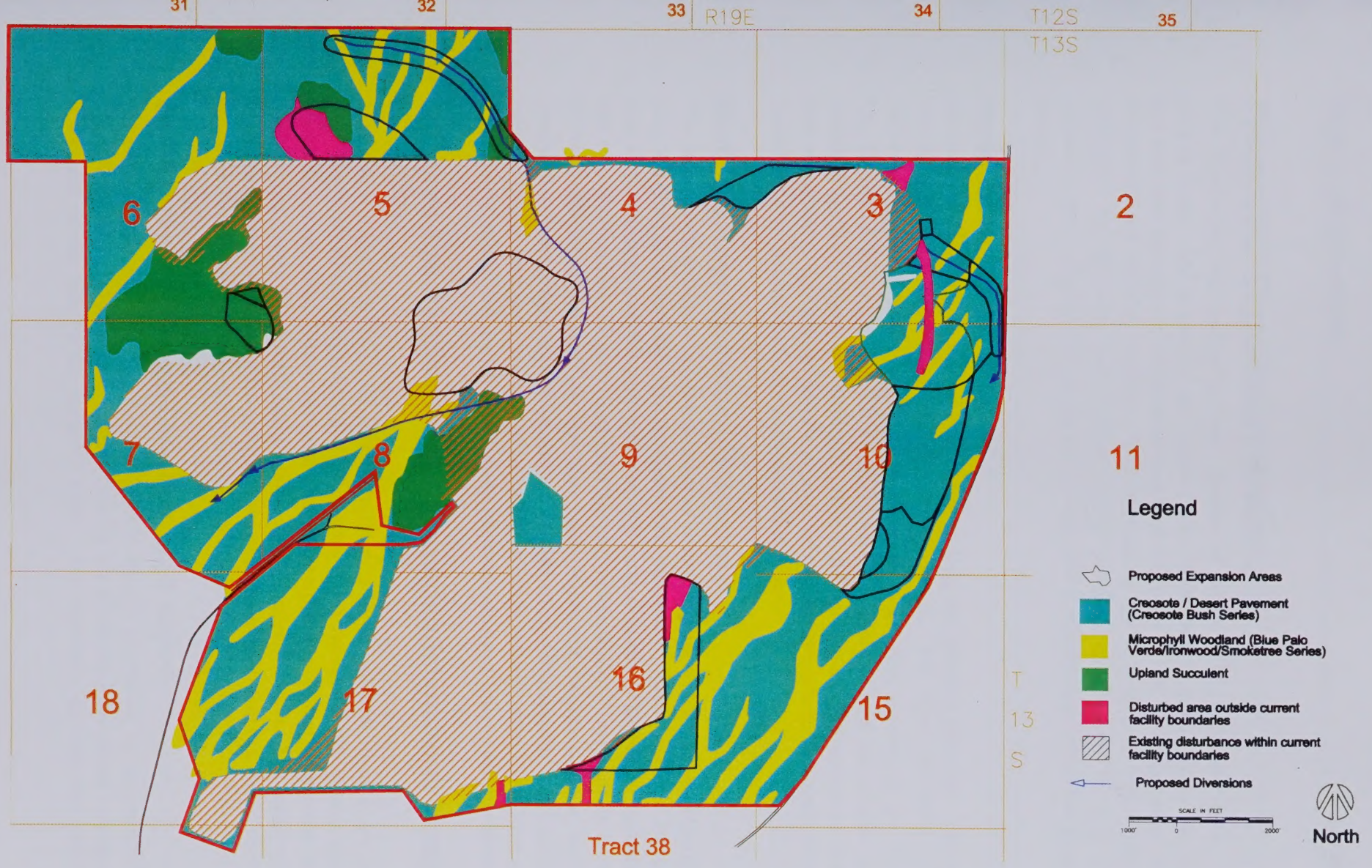
Microphyll woodland is also considered by CDFG to be an indicator of CDFG jurisdictional streambeds under section 1601 of the Fish and Game Code. The other indicators on-site are the desert washes. Portions of these woodlands are in areas already approved for disturbance and compensated in accordance with previous environmental mitigation.

Creosote/Desert Pavement

Creosote/desert pavement habitat falls within the creosote bush series. This series is characterized by widely spaced creosote bush (*Larrea tridentata*) as the dominant vegetation. Other plants potentially occurring in fewer numbers are brittle bush (*Encelia farinosa)*, many-headed barrel cactus *(Echinocactus polycephaluscholla var. polycephalus)*, cholla, Mormon tea *(Ephedra)*, indigo bush, and white bursage (*Ambrosia dumosa)*. This series is usually associated with large areas of desert pavement. Within the project area, this vegetation series is found in the areas between the washes and is dominated by creosote bush.

Upland Succulent

Upland succulent habitat are those upland areas that would most likely also be included in the creosote bush series but were different enough in vegetation to be dealt with independently. These areas have a distinct lack of vegetation. Within the project area, this vegetation series is found within the hilly higher elevation areas on site and contains ocotillo, cholla species, and red brome.



3.3-7

SOURCE: Nevada Environmental Consultants, Inc., 1999

7/7/00

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Mesquite Mine Expansion EIR/EIS

Existing Vegetation Communities

FIGURE 3.3-1

Proposed Expansion Areas

The topography surrounding the mine consists of gently rolling hills interwoven with washes of varying depth. Soil is gravelly and overlain with larger basaltic rocks. There are several dirt roads that lead onto the property which have been used for travel to and from exploratory drill sites and by recreational off highway vehicles. Soil surrounding the drill sites in some locations has been displaced. The following describes the existing biological environment for each of the proposed expansion areas. Figure 3.3-1 shows the existing habitat communities within the proposed expansion areas.

North Extension (51.2 Acres)

Off-road vehicle traffic, as well as exploratory drilling, has disturbed this area. The area is hilly and littered with rocks, cobbles and boulders of varying size. The lower elevations consist of sandy washes and desert pavement, with large boulders and in-situ rock outcrops at the higher elevations. The vegetation associated with this area is sparse, with creosote bush and ocotillo representing the dominant species. Microphyll woodland exists in the lower elevation washes of this area but it is very sparse and is not likely to provide much cover for wildlife. Due to the rocky nature of the area, some habitat for animals such as the chuckwalla does exist.

North Drainage Diversion (45.3 Acres)

The area covers a long and narrow projection that runs perpendicular to the existing washes in the area, and is made up alternately of desert pavement and sandy washes. Some of the washes are more than 10 feet deep and exhibit very steep, almost vertical banks. The only noticeable disturbance in this area consists of the rarely used off-highway vehicle trails. Vegetation in this area is fairly diverse. Patches of microphyll woodland exist within the washes. These woodland patches, combined with the steep banks of the washes, provide cover and shade for larger animals. Tracks of coyotes, bobcat, and mule deer are common in the sandy wash bottom. The lands adjacent to the washes are generally flat and open with large portions exhibiting little or no vegetation at all.

Proposed East Rainbow North Overburden/Interburden Storage Area (22 Acres)

This area is made up primarily of desert pavement, with two or three small sandy washes and one large deeply cut wash running through it. Dirt roads as well as several foundations for small buildings are present in this area. Within the wash areas, desert plants commonly associated with sandy areas can be found. Many of the wash banks exhibit signs of rodent burrows. The topography in this area is generally flat with rocky outcroppings in the vicinity of the wash that could provide habitat for chuckwalla as well as perching sights for birds such as the red-tail hawk.

East Rainbow Drainage Diversion (32.8 Acres)

The east drainage area mainly consists of desert pavement intersected by wide shallow sandy washes. The soil is sand mixed with small gravel. There is one access road that passes through this area and it is bordered on the east by the property fence. The washes in the East Drainage Diversion area

exhibit microphyll woodland patches. These woodland patches could provide shade for larger mammals as well as nesting sites for birds.

East Rainbow Extension (126 Acres)

The area mainly consists of desert intersected by wide, shallow, sandy washes. The soil is sand mixed with gravel. Only one access road passes through this area. There is very little elevation change within this area. The washes in this area exhibit microphyll woodland patches. The dominant vegetation within these woodland patches are palo verde and ironwood. These woodland patches provide shade for larger mammals as well as nesting sites for birds. The desert pavement areas are more sparsely vegetated, with the dominant vegetation being creosote bush.

East Rainbow South Overburden/Interburden Storage Area (132.1 Acres)

This area mainly consists of desert intersected by wide, shallow, sandy washes. The soil is sand mixed with small gravel. There is a berm surrounding the majority of this parcel as well as one access road that passes through it. A large wash runs through the center of this area. Unlike the other washes in this region, the wash in this area does not exhibit the typical microphyll woodland patches. With the exception of one or two small patches, the washes here are generally bare of vegetation and exhibit signs of scouring.

3.3.1.3 Wildlife

High average temperatures, sparse precipitation and limited vegetation cover impose constraints on the productivity of the area as wildlife habitat. The wildlife present consists primarily of common and widespread desert species adapted to severe desert conditions of heat, drought, and wind. With annual plants comprising a significant portion of the flora, a distinct seasonal element is correlated with animal activity. Birds tend to use the area for nesting in early spring, but most species tend to disperse to more favorable habitats during the summer and fall. Mammals are present year round, with the exception of migratory bats, which occur only seasonally. The proposed site is not identified as part of a known or probable wildlife corridor (Imperial County, 1993b).

No permanent water sources are present in the vicinity, although ephemeral ponds can occasionally occur as a result of heavy precipitation or runoff where there are undrained depressions, such as in gravel pits or adjacent to roads.

The Lower Colorado River Valley (LCRV) and Colorado Desert are important habitat features for the migration of birds to and from Mexico, Central, and South America (Small, 1974; and Rosenberg *et al.*, 1991). Habitat loss and disturbance along the LCRV has dispersed avian species into surrounding desert microphyll woodlands. Consequently, the microphyll woodland community at the Proposed Action site is potentially important for both resident and migratory birds. Animal species encountered or expected on-site are, for the most part, common species of desert microphyll woodland, creosote bush scrub and upland succulent communities. Species encountered in the biological surveys are listed in NECI Biological Report, 2000. Twenty wildlife species were observed

on-site during field surveys conducted on April 14-16, 1999, within all seven of the proposed expansion areas.

Birds

Twelve species of birds were observed within the project area. The greatest number of species utilize the reaches of the desert microphyll woodland communities. Species observed included the ash-throated flycatcher (*Myiarchus cinerascens*); black-tailed gnatcatcher (*Polioptila melanura*); common ground dove (*Columbina passerina);* greater roadrunner (*Geococcyx californianus);* orange-crowned warbler (*Vermivora celata);* lesser nighthawk (*Chordeiles acutipennis);* mourning dove (*Zenaida macroura);* white-winged dove (*Z. asiatica);* rock wren (*Salpinctes obsoletus);* redtail hawk (*Buteo jamaicensis);* turkey vulture (*Cathartes aura); and,* Costa's hummingbird (*Calypte costae*). Several other bird species are expected to occur in the project area based on habitat requirements and known species range.

Mammals

Two mammal species were observed during the field surveys. Recent mule deer (*Odocoileus hemionus*) scat and tracks were observed in all of the wash areas within the proposed expansion areas. The black-tailed jackrabbit (*Lepus californicus*) was also frequently observed. NECI Biological Report, 2000 provides a list of wildlife species observed during the field surveys. Although not observed during the surveys, the vicinity of the project site is considered to be an occasional Nelson's bighorn sheep (*Ovis canadensis)* use area, as the Chocolate Mountains are known to be a habitat area for the species. Coyotes (*Canis latrans*) and several bat species are also known to occur in the area.

Wildlife habitat and species at the proposed expansion areas are typical of the region for similar elevations and drainage conditions. Mammal species encountered or expected to occur are, for the most part, common species of desert microphyll woodland and creosote bush scrub.

Amphibians

No areas within the proposed expansion lands exhibited the extended pooling or ponding of water necessary to create suitable habitat for sensitive amphibian species (See NECI Biological Report, 2000). No sensitive amphibian species were observed during the surveys. However, the Couch's spadefoot toad (*Scaphiopus couchi*) is known to occur downslope of the project area, adjacent to the ISDRA.

Reptiles

Six reptile species were observed in the proposed expansion areas. The side-blotched lizard (*Uta stansburiana*), western whiptail (*Cnemidophorus tigris*), zebra-tailed lizard (*Callisaurus draconoides*), collared lizard (*Crotaphytus* spp.), desert iguana (*Dipsosaurus dorsalis*), and desert tortoise (*Gopherus agassizii)* were observed during the field surveys. The desert tortoise is a state and federal threatened species and is addressed in more detail in Section 3.3.1.4.

3.3.1.4 Endangered, Threatened and Other Sensitive Species

State- and federally-listed threatened and endangered species, and species federally-proposed for listing are discussed in this section. A complete list of all threatened, endangered, and proposed species with the potential to occur within the project area is provided in NECI Biological Report, 2000. Other special-interest species include CDFG Species of Special Concern (CSC). Animals designated CSC in California by CDFG and listed on the NDDB are species that experts feel are declining through all or portions of their ranges. Other special-interest species include those listed by the CNPS and game species.

Vegetation

Plant species are categorized at the state and/or federal level. At the state level they are either listed in the California Endangered Species Act (CESA), or are listed by the California Native Plant Society (CNPS). At the federal level, they are either listed in the federal Endangered Species Act, or are listed by the Bureau of Land Management as species of concern. Only one sensitive plant species is known to occur in the project area. Threatened, endangered, CNPS-listed, and species of concern (SPOC) plants that may occur within the project area are listed in Table 3.3-1.

Surveys for plants listed in Table 3.3-1 were conducted on April 14-16, 1999, within all eight of the proposed expansion areas. Each area was divided into corridors ranging from 10 to 15 meters in width depending on terrain, and each of these corridors was walked by a field biologist. The only sensitive plant species observed within the proposed expansion areas was the fairy duster; however, suitable habitat exists within the proposed expansion areas for several other sensitive species. Figure 3.3-2 shows threatened, endangered and special status species observed in each proposed expansion area during the surveys.

Species Observed On-site

Fairy Duster

The fairy duster (*Calliandra eriophylla*) was the only sensitive plant species observed on-site during the surveys, and is listed as a CNPS List 2 species. The fairy duster prefers sandy washes and gullies below 1,000 feet and blooms February to May (Hickman, 1993). This type of habitat is prevalent within the Proposed Action areas and individuals of this species were observed within three of the expansion areas. More than 20 individuals were observed within the proposed "East Rainbow Overburden/Interburden" area, 5-10 individuals were observed in the proposed "East Rainbow Extension" area, and less than 20 individuals were observed in the proposed "Leach Expansion" area. In all three of these areas, this species was found along the edges of substantial washes.

Species Not Observed On-site but Could Occur

There are several sensitive plant species listed in Table 3.3-1 that were not observed during the surveys, but could potentially occur on-site because the property provides suitable habitat. These

Table 3.3-1

Threatened, Endangered, CNPS-Listed, and SPOC Plants That May Occur Within the Project Area

Common Name	Scientific Name	Federal/State Status
Fairy duster	*Calliandra eriophylla*	CNPS#2[1]
Ribbed cryptantha	*Cryptantha costata*	CNPS#4[2]
Winged cryptantha	*Cryptantha holoptera*	CNPS#4
Foxtail cactus*	*Escobaria vivipara var. alversonii*	CNPS, 1B, BLM Sensitive Species[3]
Slender-lobed four o'clock	*Mirabilis tenuiloba*	CNPS#4
Munz cholla*	*Opuntia munzii*	CNPS, 1B, BLM Sensitive Species
Wiggin's opuntia*	*Opuntia wigginsii*	SPOC[4]

Source: NECI, 2000; BLM review comments, 8/188/2000.

[1] CNPS #2= California Native Plant Society, "Rare or Endangered in California, More Common Elsewhere" (all plants on this list fall under the California Native Plants Protections Act).

[2] CNPS #4= California Native Plant Society, "Plants of Limited Distribution".

[3] CNPS, 1B, BLM Sensitive Species= California Native Plant Society, Plants that are "Rare, Threatened or Endangered in California and Elsewhere".

[4] SPOC = Federal species of concern

* species not likely on study areas (See NECI Biological Report, 2000).

include the ribbed cryptantha (*Cryptantha costata*) (CNPS List 4); winged cryptantha (*Cryptantha holoptera*) (CNPS List 4); and, slender-lobed four o'clock flower (*Mirabilis tenuiloba)* (CNPS List 4). The NECI Biological Report (2000) provides a complete description of sensitive species not observed during the surveys although suitable habitat is present.

Based on the field surveys, the property does not provide suitable habitat for any of the other sensitive species listed in Table 3.3-1 (See NECI Biological Report, 2000).

Reptiles

Species Observed On-site

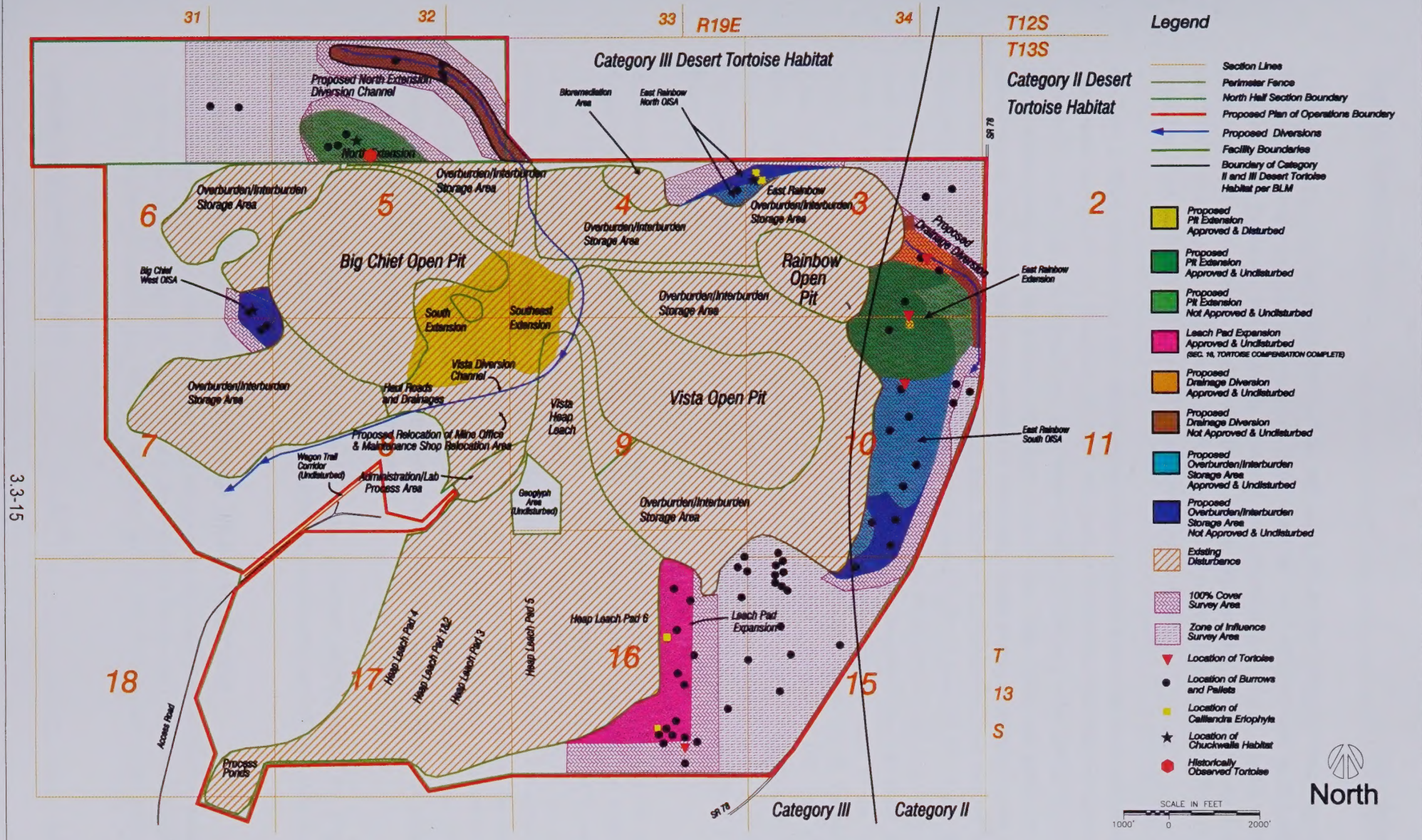
Desert Tortoise

The desert tortoise *(Gopherus agassizii)* is a federally-threatened, California-threatened, and BLM Species of Special Concern; and is known to occur on the site. Desert tortoise activity is seasonal, with peak active periods occurring in the spring between late March and early June, when ambient temperatures are moderate. Tortoise densities are generally highest in the creosote-white bursage community at lower elevations. However, less dense populations do occur in the higher elevation blackbrush community.

BLM habitat categories for desert tortoise, ranging in decreasing importance from Category I to Category III, were designed as management tools to assure future protection and management of these areas and their associated desert tortoise populations (U.S. Department of the Interior (U.S. DOI), 1988). Category I habitat areas are considered essential to maintenance of large viable populations, have primarily medium- to high-density populations, and have resolvable conflicts. Category II habitat "may be essential to the maintenance of viable populations." Category III habitat is defined as having a low to medium tortoise population density that is not contiguous with areas containing a medium to high density of tortoises (i.e. populations are generally stable or declining) and is outside of the designated critical habitat areas.

The BLM has classified the property and surrounding lands as containing both Category II and Category III tortoise habitat. Category boundaries relative to the proposed mine expansion areas are shown in Figure 3.3-2.

Desert tortoise surveys were conducted on April 14-16, 1999 within all of the proposed expansion areas. In May of 2000, the acreage of several proposed expansion areas was enlarged, and it was recognized that additional areas needed to be surveyed. On June 1, 2000, surveys were conducted on an additional 22 acres of land in the leach pad expansion area, and 9 acres in the East Rainbow South OISA. The surveys utilized survey methods that are currently acceptable to USFWS. Each area was divided into corridors ranging from 30-45 feet in width depending on terrain. The difference reflects safety issues associated with unstable wash banks and steep slopes. Biologists then surveyed each of the corridors in the proposed expansion areas, as well as a 350-foot buffer zone in undisturbed areas.



SOURCE: NECI, Newmont Mining Corp., 1999, 2000

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Threatened, Endangered, and Special Status Species

FIGURE 3.3-2

While surveying, the biologists watched for all signs of tortoise activity including live animals, burrows, scat, and carcasses. Any burrows found were surveyed and mirrored to determine whether tortoises were present. All evidence observed was recorded and Global Position System (GPS) coordinates were taken where appropriate. Based on the field surveys, a total of 4 tortoises, 8 pallets and 59 burrows were observed throughout the proposed expansion areas and the 350-foot buffer zone (which will not be disturbed). (See NECI Biological Report, 2000).

On June 1, 2000, surveys were also conducted on adjacent lands within the zone of influence. These areas were surveyed in an attempt to quantify the number of tortoises that may be indirectly affected as a result of the proposed expansions. The zone of influence surveys were conducted in areas where the proposed disturbance was within 2,400 feet of the 8-foot high chain link perimeter fence along the northeast, east, south, and west portions of the Mine. Areas surveyed included lands north of the East Rainbow Diversion Channel, east of the East Rainbow Pit Extension, and east of the leach pad expansion. In addition, a zone of influence survey was completed west of the North Big Chief Pit Extension, and of the North Drainage Diversion. Zones of influence surveys were not completed in areas where tortoises have access to adjacent lands and tortoise-proof fencing would be utilized in order to reduce/avoid indirect impacts to tortoises. These areas include north of the East Rainbow OISA, east and south of the North Drainage Diversion, and north of the North Extension. In the zones of influence surveys, up to five transects were spaced at intervals of 100 feet, 300 feet, 600 feet, 1,200 feet, and 2,400 feet outside the proposed expansion areas. Biologists searched for all signs of tortoise activity including live animals, burrows, scat, and carcasses. All evidence observed was recorded. Any burrows found were mirrored to determine whether tortoises were present. The backs of all burrows were observed.

Another survey was conducted on April 16 and September 2, 1999 along Highway 78, where it runs adjacent to and parallel with the mine property line, to determine if tortoises are crossing Highway 78 and attempting to get under the mine fence. The fence was surveyed both in April and September in order to ensure that the fence was checked during the beginning and the end of the active season. Sensitive plant species were also surveyed during the desert tortoise surveys. No signs of tortoises, whether individuals or signs of burrowing under the fence, were observed during the surveys. The majority of the fence has a protective berm of soil heaped along the inside, which appears to serve as a deterrent to burrowing. Also, no sensitive plant species were observed during the survey. During the interim months, no signs of tortoise fatalities or activity were observed along this section of State Highway 78 by NECI or Mesquite Mine personnel.

An adult tortoise has been repeatedly sighted by mine personnel in the area of the proposed North Extension. This individual was not observed during the tortoise surveys but may still be utilizing this area as part of its home range.

Species Not Observed On-site but Likely to Occur

Only one sensitive reptile species that was not observed is expected to occur on-site, based on habitat requirements and known species range. This is the Western Chuckwalla (Sauromalus obesus), which is a federal species of concern and a BLM sensitive species. NECI Biological Report (2000) provides a

complete description of sensitive wildlife species that were not observed during the surveys but are likely to occur on-site.

Birds

Species Observed On-site

No sensitive bird species were observed on-site during the field surveys.

Species Not Observed On-site but Likely to Occur

There are several sensitive bird species that were not observed during the field surveys that could occur on-site based on existing nests in the project area, species range, and on-site habitat suitability. These include the burrowing owl (*Athene cunicularia*) (California Species of Special Concern); Le Conte's thrasher (*Toxostoma lecontei*) (California Species of Special Concern); and, prairie falcon *(Falco mexicanus)* (California Species of Concern). NECI Biological Report (2000) provides a complete description of sensitive wildlife species not observed during the surveys but could occur on-site.

Mammals

Species Observed On-site

Mule Deer

The mule deer *(Odocoileus hemionus)* is a listed California Game Mammal species known to occur in the project area. The mule deer in this region are members of a subspecies known as the burro deer (*Odocoileus hemionus eremicus*). Their range is delineated by the CDFG as Deer Zone D12. Recent mule deer scat and tracks were observed in all of the wash areas within the proposed expansion areas.

Suitable habitat exists within the entire project area. Migration corridors to and from the river follow the major wash systems where microphyll woodland can provide shade and cover. Scat and tracks were observed within all of the washes in the Proposed Action area.

Species Not Observed On-site But Which May Occur

There are several sensitive mammal species that were not observed during the field surveys that may occur on-site because the property provides suitable habitat. These include several bat species and the bighorn sheep. NECI Biological Report (2000) provides a complete description of sensitive wildlife species not observed during the surveys but are likely to occur on-site.

Bats

Several species of sensitive bats are known to utilize microphyll woodland wash systems as foraging corridors. Based on consultation with BLM, CDFG, Newmont Mining Corporation, and Dr. Pat Brown-Berry (a consultant biologist specializing in bat ecology), any disturbance to microphyll woodland could pose a potential risk to bat species roosting in the region.

To determine the presence of sensitive bat species in the project area, a survey was conducted of abandoned underground mines within eight miles of the Mine boundary, except for mines located in the Chocolate Mountain Gunnery Range. The survey included examining 7.5-minute topography maps for old mines, visiting the mines and determining whether they had the potential to harbor bat roosts. Based on the survey, three sites were identified in the region as potential or known roosting sites. Sensitive bat species observed within these three sites and likely to occur in the project area include California leaf-nosed bat (*Macrotus californicus*); greater western mastiff bat (*Eumops perotis*); southwestern cave myotis (*Myotis velifer brevis*); small-footed myotis (*Myotis ciliolabrum*); desert pallid bat (*Antrozous pallidus pallidus*); Townsend's big-eared bat *(Corynorhinus townsendii)* and, spotted bat (*Euderma maculatum*). A description of each of bats species, their protective status, and the locations where they have been observed is provided in NECI Biological Report (2000).

Bighorn Sheep

The bighorn sheep *(Ovis canadensis)* is a listed California Game Mammal and BLM sensitive species known to occur in the region. The bighorn sheep is listed on the CDFG NDDB list of special animals because of concern about population setbacks due to disease, diminished survival, and habitat loss.

Bighorn sheep occur on open slopes in hot and dry desert regions where the land is rough, rocky, sparsely vegetated, and characterized by steep slopes, canyons, and washes. Most of these sheep live between 300 and 4,000 feet (ft) in elevation where average annual precipitation is less than 4 inches (in) and daily high temperatures average 104 degrees Fahrenheit in the summer. Alluvial fan areas are also used for breeding and feeding activities. Bighorn sheep populations typically aggregate from May through October due to a combination of breeding activities and diminishing water sources.

The proximity of the proposed expansion area to the Chocolate Mountains combined with the elevation make the proposed expansion areas suitable habitat for bighorn sheep. Bighorn sheep have been seen within a mile and a half of the mine property and have even been observed crossing into the Algodones Dunes area (Andrew, 1999). Mine personnel have not recorded seeing a bighorn sheep on the mine property since the beginning of mining in 1984.

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3.4 CULTURAL RESOURCES

"Historic properties include districts, sites, buildings, structures and objects significant in American history, architecture, archeology, engineering and culture" (36 CFR Part 60.1). These resources may be important for scientific, historic or religious reasons to cultures, communities, groups or individuals. Cultural resources within the area of the proposed Mesquite Mine expansion are comprised of prehistoric and historic archeological sites, including isolated resources.

3.4.1 Introduction

A cultural resource investigation was conducted by Mooney & Associates during March, April, July and August 1999. The investigation included archival records search, field survey, cultural resource inventory and focused subsurface testing of potentially affected historic properties within the 490-acre area of potential effect (APE). The following discussion of cultural resources presents a summary of information provided in the *Final Cultural Resources Assessment and Evaluation of the Proposed Mesquite Mine Expansion: Imperial County, California*, prepared by Mooney & Associates (September 16, 1999; February 2000).

To date, more than 17 archaeological reports of survey, inventory, testing and data recovery programs have been completed for the Mesquite Mine and areas associated with developing the mine since the 1970s. The APE for the Proposed Action is shown on Figure 3.4-1.

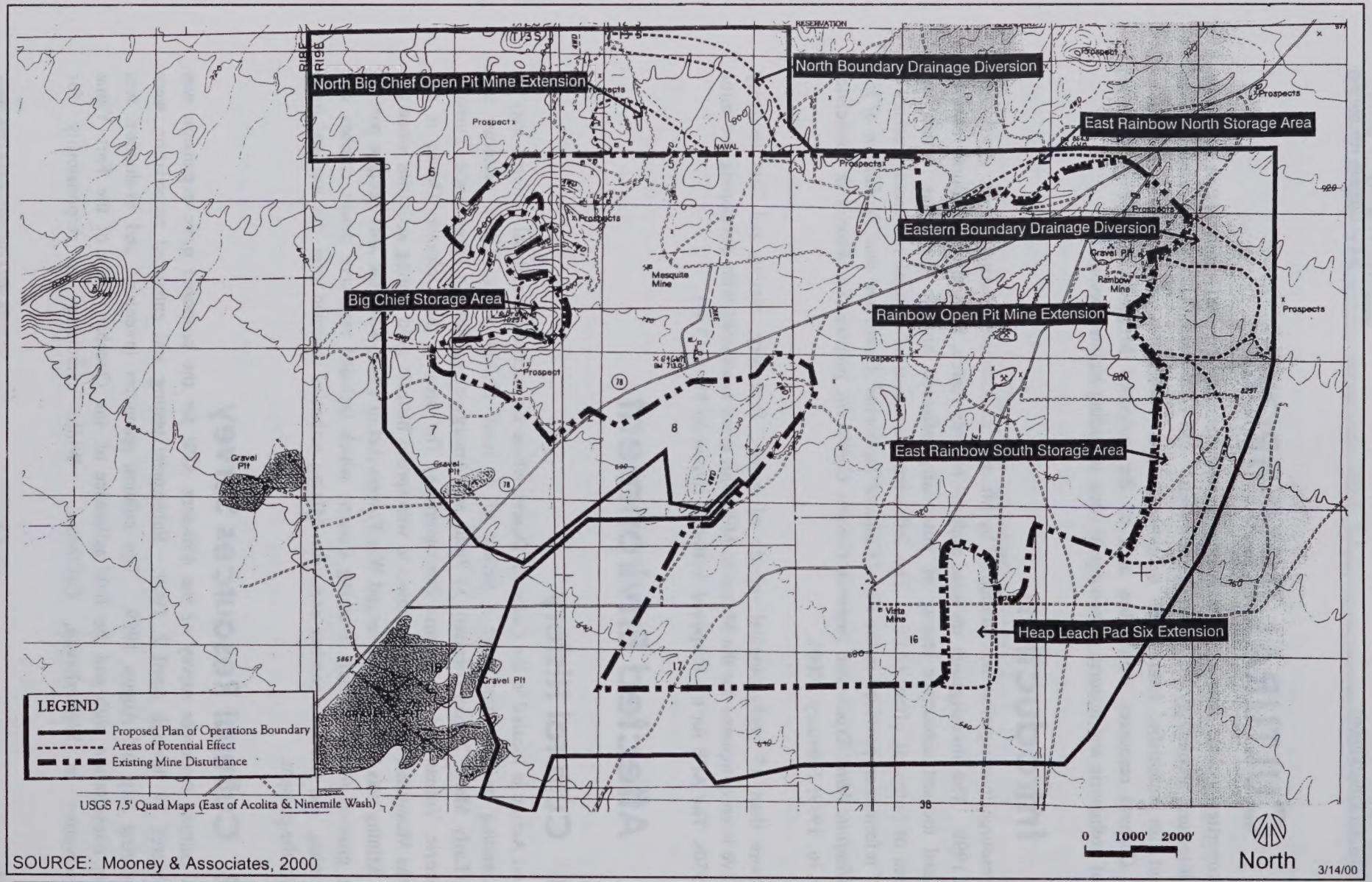
3.4.2 Affected Environment

3.4.2.1 Cultural History

The Proposed Action is located in the Colorado Desert, where six successive cultural patterns may be defined, extending back in time over a period of at least 12,000 years. These patterns are: 1) Malpais (Early Man), 2) San Dieguito, 3) Pinto and Amargosa, 4) Patayan (prehistoric Yuman), 5) Ethnohistoric Yuman and 6) Historic Euroamerican. The area of the Colorado Desert in the vicinity of the Mesquite Mine has been subject to widespread historic gold mining activities since the mid-1800s. Mining was halted by the second War Powers Act of 1942, when the area became part of the training grounds for the Desert Training Center, which included extensive desert combat and survival training, and full-scale combat exercises. Mining activities resumed after the war and have continued to the present.

3.4.2.2 Cultural Resources Survey

A Class III cultural resources survey of the 490-acre APE for the proposed mine expansion was conducted March 29 through April 2, 1999. Subsequent testing and enhanced recordation were conducted during July and August 1999. The cultural resources inventory and evaluation was conducted in consultation with and the field assistance of, the Quechan Tribe of the Fort Yuma Indian Reservation in Winterhaven, California. While exercising its responsibility for



SOURCE: Mooney & Associates, 2000

3.4-2

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Areas of Potential Effect (APE)

FIGURE 3.4-1

Native American consultation, BLM approved Mooney & Associates to request assistance from the Quechan Cultural Committee in identifying properties which may be of religious or cultural significance to the Quechan. The Quechan Cultural Committee did not indicate to the BLM or Mooney & Associates that there are such properties within the APE.

The records review and intensive ground survey identified 40 areas of cultural activity, of which 11 had been recorded previously, and 29 were new. Of these 40 indicators of cultural activity, 31 were sites more than 50 years old, two were less than 50 years old, and seven were isolates. After eliminating from further consideration four sites that were outside the APE, the two recent sites, and seven isolates, a total of 27 sites were evaluated for eligibility to the National Register, including sparse lithic scatters, a lithic scatter with pottery, a lithic scatter with stacked rock feature and mining prospect, two temporary camps, and a trail segment with cleared circle and rock cairns. After intensive recordation and application of the California Archaeological Resource Identification and Data Acquisition Program, where appropriate, 20 sites were found to not meet criteria for eligibility to the National Register. The remaining seven sites were subjected to additional recording and limited testing, following approval by BLM.

Implementation of the test plan resulted in the collection of additional documentation. This information was then analyzed and incorporated into the resource inventory for the Proposed Action. Site record files were revised as necessary. As a result of this process, the research potential of the seven identified resource sites has been documented. BLM determined these sites do not meet criteria of eligibility to the National Register of Historic Places.

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3.5 PALEONTOLOGICAL RESOURCES

3.5.1 Mesquite Mine

The geology of the site is described in detail in Section 3.1.1. The nature and origin of the geologic formations on-site is such that no significant paleontological resources would be expected to exist. The various rock units present at the site show no evidence that they contain fossils. The alluvial material on the site is too young to contain significant fossils and was deposited in such a high-energy manner that it would not be expected to retain fossils. The Bear Canyon Conglomerate was also deposited in a high-energy manner and would not be expected to retain fossils. There are some lacustrine clay deposits in the Bear Canyon Conglomerate, but that formation has only been exposed in the Mesquite Mine pits, and there has been no evidence to indicate it contains fossils. Basement rock consists of metamorphic and igneous rocks, which do not contain fossils.

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3.6 TRANSPORTATION

3.6.1 General

3.6.1.1 Scope

Figure 3.6-1 shows the primary transportation features in the Imperial County area. The transportation system consists of a network of rural highways that provides access through this sparsely populated desert region. The Mesquite Mine is located in the east-central portion of Imperial County in an area that normally has little vehicular traffic other than mine employees. The region immediately surrounding the mine does not include a civilian airport, though the mine does have a FAA approved heliport for emergency purposes.

Traffic conditions in the mine area are sparse, with State Highway 78 (SR 78) and Ogilby Road both operating at substantially below their design capacities (i.e., less than 5 percent of capacity). Mine related traffic is episodic, corresponding primarily to employee shift changes, though intermittent mine delivery traffic occurs throughout each day.

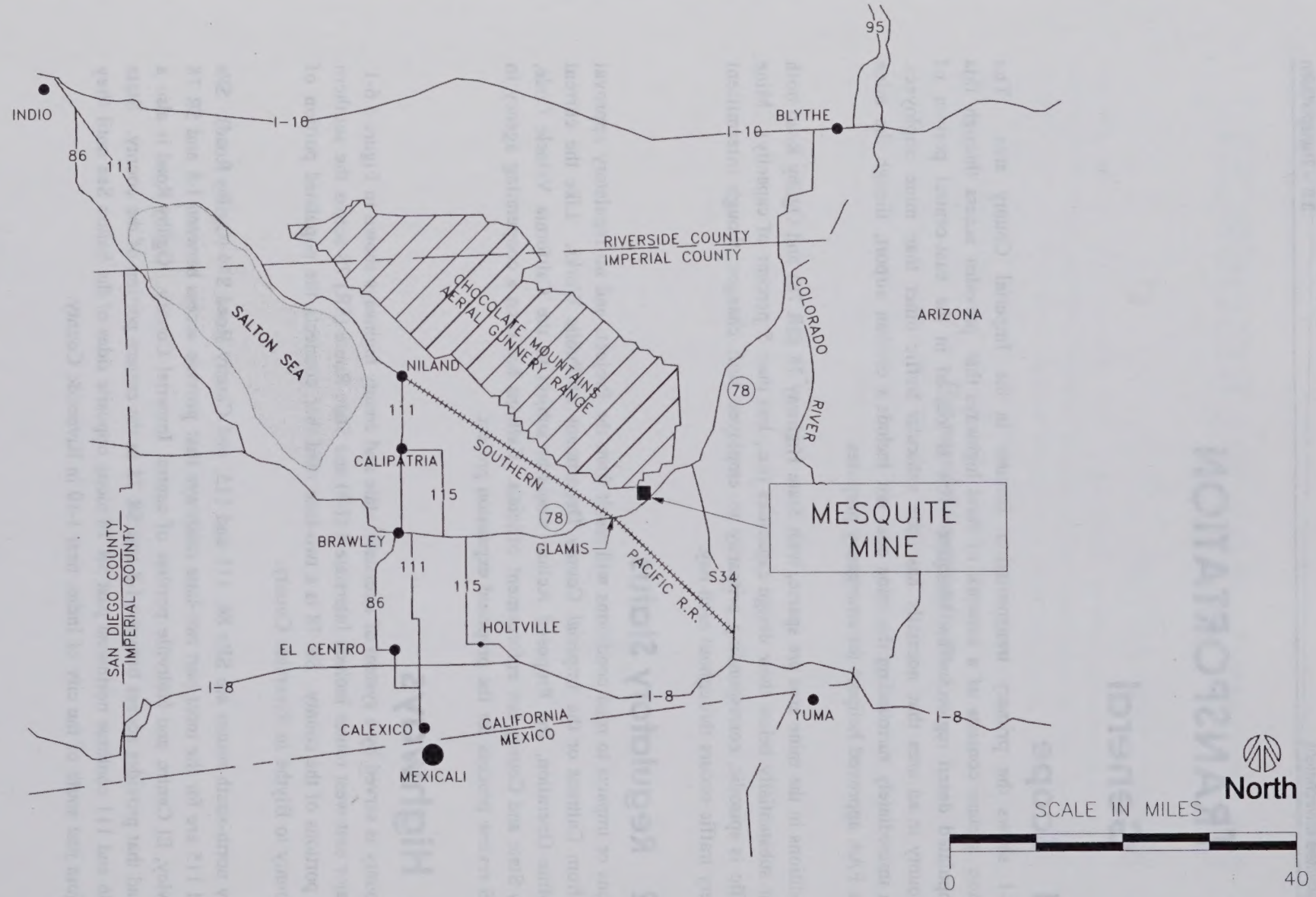
3.6.1.2 Regulatory Status

No alterations or impacts to road conditions will result from the Project, and no regulatory approval is required from Caltrans or the Imperial County Department of Public Works. Like the current Mesquite Mine Operation, the Proposed Action would be subject to the California Vehicle Code, enforced by State and County law enforcement officials. Caltrans has been a cooperating agency in the EIR/EIS review process for the proposed expansion project.

3.6.2 Highways

Imperial County is served by a system of interstate, state and county highways shown in Figure 3.6-1. The two major east-west routes include Interstate 8 (I-8) and State Route (SR) 78 across the southern and central portions of the county. SR 78 is a two-lane road that connects the populated portion of Imperial County to Blythe in Riverside County.

The primary north-south routes are SRs 86, 111 and 115, and County Road S34 (Ogilby Road). SRs 86, 111 and 115 are for the most part two-lane roadways that provide access between I-8 and SR 78 in the Brawley, El Centro and Holtville portion of central Imperial County. Ogilby Road is also a two-lane road that provides access between I-8 and SR 78 in the eastern portion of the county. State Highways 86 and 111 continue northwest past SR 78 along opposite sides of the Salton Sea until they eventually join just south of the city of Indio, near I-10 in Riverside County.



SOURCE: Newmont Mining Corporation, 1999

7/7/00

3.6-2

BRG CONSULTING, INC.

Mesquite Mine Expansion EIR/EIS

Primary Transportation Routes in the Imperial County Area

FIGURE 3.6-1

Access to the mine is via SR 78, which extends along the southern border of the mine property boundary. The mine access road provides access for all visitors, employees and deliveries to the mine.

Several unpaved roads exist east of the mine site. These roads are infrequently traveled and are used primarily for access by gravel operators and as a limited (Restricted) access route into the aerial gunnery range, north of the project area. The unpaved roads are occasionally used for off-road vehicle recreation activities.

Traffic volumes on SR 78 are approximately 1,600 trips per day in the project area (Caltrans, 1998). A "trip" is the passage of one vehicle in either direction across a particular location.

Typical peak hourly traffic volumes are associated with the peak Mesquite Mine employee trips. During these periods, the flow rate on SR 78 in the project area is estimated to be approximately 390 vehicles per hour, resulting in a level of service (LOS) of A (free flowing traffic with little delay). LOS is determined by the amount of traffic on roadways from A to F, A being the best, free flowing traffic, and F being the worst with gridlock and congestion. During the afternoons before and mornings after holiday weekends from October 1st through May 31st, anecdotal accounts indicate that the level of service on SR 78 in the project area may reach F (forced flow with frequent delay); however, specific data to confirm or refute this was not identified. The vast majority of the increased weekend traffic occurs to or from the west, as campers arrive from the more heavily populated areas of Southern California, and later depart in that direction at the end of the weekend. The design capacity of the stretch of SR-78 that extends past the project site is 2,800 trips per hour, or more than 60,000 trips per day (Caltrans, 1992).

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3.7 NOISE

3.7.1 Introduction

3.7.1.1 Scope

The Proposed Action site is located in an area that has no permanent residents and very few activities that generate substantial noise events. Noise generating activities that exist in the vicinity include:

- The passage of traffic on SR 78.
- Infrequent military aircraft performing maneuvers associated with the CMAGR located immediately to the north.
- Small-scale gravel withdrawal activities in the area to the west of the project site.
- The passage of trains on the Southern Pacific Railroad Main Line located to the west of the Glamis Beach Store.
- Off-road vehicle (ORV) activities, primarily at the Imperial Sand Dunes Recreation Area (ISDRA) near the Glamis Beach Store during weekend periods.

Project-related noise generating activities would occur on the mine site only. Potential receptors include Mesquite Mine employees and visitors, gravel withdrawal operators, campers who use the public lands west of the Proposed Action area, people in vehicles traveling along SR 78, and wildlife in the area. The nearest permanent residents number approximately 10 in the Boardman and Glamis Store areas, about 3 and 3.5 miles away, respectively. Due to their distance from the mine, project-related noise events would not be heard in those areas. As a result, the residents of these areas are not part of the definable group of potential receptors for noise from the project site.

Regulatory Status

Depending upon the source, regulation of noise levels can occur at the federal, state or local level. Except for normal vehicle noise restrictions (e.g., for delivery and passenger vehicles), the only noise ordinances that would apply to the mine result from the Mine Safety and Health Administration (MSHA). The California Department of Health Services, Office of Noise Control, provides guidelines to communities to control and abate noise. County noise management occurs through the Imperial County General Plan. The following laws and regulations would apply to noise generated by mining activities in the proposed expansion areas:

- Noise Control Act of 1972 (42 U.S.C. 4901 et seq.).
- Imperial County General Plan and Imperial County General Plan Update adopted November 1993.

3.7.2 Project Area

3.7.2.1 Mesquite Mine

The Mesquite Mine is the primary source of noise currently generated in the project area. Substantial noise events at the Mesquite Mine are the result of:

- Ore and overburden removal and handling.
  - Drilling
  - Blasting
  - Ore and overburden loading, hauling, and dumping
- Construction of haul roads and structures
  - Earthmoving equipment
  - Construction equipment

These operations are conducted using equipment and procedures that satisfy all Mine Safety and Health Administration (MSHA) noise requirements. Receptors for these noises are mostly the mine workers, users of the Mesquite Mine Overlook Trail, and occasionally SR 78 travelers as they pass through the area.

3.7.2.2 Chocolate Mountain Aerial Gunnery Range

The Chocolate Mountain Aerial Gunnery Range (CMAGR) is used for live munitions delivery practice by different branches of the U.S. armed forces. The CMAGR boundary begins approximately one mile to the north of the Proposed Action boundary. Intermittent aircraft noise can be heard throughout the area as military aircraft fly in and out of the region. Occasionally, the faint sound of exploding munitions can be heard in the distance.

3.7.2.3 State Route 78 (SR 78)

SR 78 extends through the Glamis Beach Store area and then northeastward for 3 miles before it passes along the southern edge of the Proposed Action boundary (Figure 2.1.2-1). Traffic along this section of SR 78 is light (1,600 trips per day; Caltrans, 1998) and, except for the Glamis Beach Store, the vicinity is deserted with the only noise events associated with occasional passing traffic.

3.7.2.4 Off Highway Vehicle Recreation

During the period of October 1st to May 31st, the Glamis Beach Store area attracts many visitors, especially on weekends, for off-road recreation in the Imperial Sand Dunes Recreation Area. During these periods, traffic increases significantly and noise events associated with OHV recreation and related traffic increases.

3.7.2.5 Gravel Withdrawal Operations

A small number of gravel withdrawal operators do conduct intermittent surficial gravel withdrawal operations in the region to the west of the project area. Noise from these infrequent activities is generated by excavation activities and transfer trucks which arrive and carry mined materials out of the area. These activities occur in deserted areas and any noise generated is seldom heard beyond the immediate area of a particular mining operation. The gravel excavation activities are conducted under a permit from the BLM.

3.8 AIR QUALITY

3.8.1 Introduction

3.8.1.1 Scope

This section describes the affected air quality environment in the vicinity of the Proposed Action.

The primary air quality issues directly associated with the Proposed Action are those related to onsite activities, including:

- Drilling, blasting, and loading of overburden/interburden and ore.
- Hauling of overburden/interburden to out-of-pit overburden/interburden storage areas (OISAs), and ore to heap leach pads.
- Heap leaching of ore.
- Processing of leach solution to extract gold.

The air quality aspects of each of these activities are evaluated in this EIR/EIS.

Off-site air quality considerations related to the Proposed Action are associated with emissions from vehicles used by commuting employees, and from trucks delivering goods to the mine. These emissions are also considered in this analysis.

For analysis of onsite and offsite air quality, the affected environment is described in terms of the Proposed Action site, and the Imperial County portion of the Salton Sea Air Basin.

An important introductory scoping consideration is related to ozone, which is the key pollutant in smog. Ozone itself is not emitted directly from cars, factories, and other sources, but instead is formed in the presence of sunlight from two "precursor" pollutants that are emitted from these sources: oxides of nitrogen (NO_x) and reactive organic compounds (ROC). Exceedances of state ambient air quality standards for ozone occur only a few times a year in Imperial County. The causes of ozone exceedances in Imperial County appear to include pollutant transport from Mexicali (Mexico), South Coast Air Basin (SOCAB), and possibly San Diego County (CARB, 1989, 1993a, 1993b, 1996). Local emissions also contribute to ozone exceedances in Imperial County (Sonoma Technology, Inc., 1992).

Transport is also important to particulate exceedances in Imperial County. A study by the Desert Research Institute (1995) determined that emissions in Mexicali contribute to particulates measured at Calexico, El Centro, and Brawley.

3.8.2 Regulatory Setting

3.8.2.1 General

Applicable federal, state, and local laws, regulations, and standards that govern air quality and air pollution are discussed in this section. Specific requirements are identified. Compliance of the Proposed Action with these requirements is demonstrated either in this section or in Section 4.1.8.4.

Primary air quality regulatory jurisdiction for the Proposed Action resides locally with the Imperial County Air Pollution Control District (ICAPCD or District). District rules, which have been developed as a result of federal and state laws and regulations, determine allowable amounts of stationary source emissions. The following paragraphs summarize general federal and state requirements, and site-specific District permitting requirements.

3.8.2.2 Laws, Regulations and Standards

Each level of government has adopted specific regulations that limit emissions from the Proposed Action. Contact information for the agencies with air quality control authority for the Proposed Action are shown in Table 3.8-1. The underlying laws, regulations, and standards are summarized in Table 3.8-2. The authority, purpose, and administering agency for each of these is discussed in more detail below.

Federal

The United States Environmental Protection Agency (EPA) implements and enforces the requirements of most federal environmental laws. EPA Region 9, which has its offices in San Francisco, administers EPA programs in California.

The Clean Air Act of 1970 established National Ambient Air Quality Standards (NAAQS) that set maximum allowable ambient concentrations, given in Table 3.8-3, for the following "criteria" air pollutants: ozone, nitrogen dioxide (NO_2), sulfur dioxide (SO_2), carbon monoxide (CO), particulate matter with aerodynamic diameter less than 10 micrometers (PM_{10}), particulate matter with aerodynamic diameter less than 2.5 micrometers ($PM_{2.5}$), and lead (Pb). Areas exceeding the primary (i.e., health-related), standard of a criteria pollutant a specified number of times during a specified period of time (e.g., 3 years) are designated "nonattainment" for that pollutant.

The Clean Air Act Amendments of 1990 defined five classes of increasing nonattainment: marginal, moderate, serious, severe, and extreme. Emissions of criteria air pollutants or precursors (e.g., NO_x, and ROC are precursors of ozone and PM_{10}, while SO_x is a precursor of PM_{10}) in nonattainment areas generally cannot be permitted without elimination of at least an equal amount of the same pollutant or its precursors through "offsets. "Areas that do not attain the NAAQS are required by the Clean Air Act to prepare Air Quality Attainment Plans to control existing and proposed sources of air pollutant emissions, such that the NAAQS may be attained by a certain target date. Regulations must

Table 3.8-1
Air Quality Control Agencies

Agency	Authority	Contact
U.S. EPA Region 9	Oversight of Permit Issuance Enforcement	Matt Haber, Chief Permits Office U.S. EPA Region IX 75 Hawthorne Street San Francisco, CA 94105 (415) 744-1254
California Air Resources Board	Regulatory Oversight	Ray Menebroker, Chief Project Assessment Branch California Air Resources Board 2020 L Street Sacramento, CA 95814 (916) 322-6026
Imperial County Air Pollution Control District	Permit Issuance Enforcement	Stephen Birdsall Air Pollution Control Officer Imperial County Air Pollution Control District 150 South Ninth Street El Centro, CA 92243 (760) 339-4606

Source: TRC, 2000.

Table 3.8-2

Laws, Regulations, Standards And Permits For Protection Of Air Quality

Law, Regulation or Standard	Purpose	Regulating Agency	Permit or Approval	Schedule and Status of Permit	Conformance (Section)
Federal					
Clean Air Act (CAA) §160-169A and Implementing Regulations, Title 42 United States Code (USC) §7470-7491 (42 USC 7470-7491), Title 40 Code of Federal Regulations (CFR) Parts 51 & 52 (40 CFR 51 & 52) (Prevention of Significant Deterioration Program)	Requires prevention of significant deterioration (PSD) review and facility permitting for construction of new or modified major stationary sources of air pollution. PSD review applies to attainment pollutants for which ambient concentrations are lower than NAAQS.	EPA	Authority to Construct (ATC).	Agency approval to be obtained before start of construction.	Compliance with Federal Requirements p. 4.1.8-34
CAA §171-193, 42 USC §7501 et seq. (New Source Review)	Requires new source review (NSR) facility permitting for construction or modification of specified stationary sources. NSR applies to pollutants for which ambient concentration levels are higher than NAAQS.	ICAPCD with EPA oversight.	ATC.	Agency approval to be obtained before start of construction.	
CAA §501 (Title V), 42 USC §7661 (Federal Operating Permits Program)	Establishes comprehensive permit program for major stationary sources.	ICAPCD with EPA oversight.	Issues Title V permit after review of application.	Permit not needed.	Page 3.8-18 of Section 3.8.2.3
CAA §111, 42 USC §7411, 40 CFR Part 60 (New Source Performance Standards - NSPS)	Establishes national standards of performance for new stationary sources, including emission limits.	ICAPCD with EPA oversight.	ATC.	No applicable NSPS.	Page 3.8-18 of Section 3.8.2.3
CAA § 112, 42 USC § 40 CFR Part 63 (National Emission Standards for Hazardous Air Pollutants- NESHAPS)	Establishes emission limits for noncriteria pollutants from specified source categories.	ICAPCD with EPA oversight.	ATC.	No applicable NESHAP.	

Table 3.8-2

Laws, Regulations, Standards And Permits For Protection Of Air Quality

Law, Regulation or Standard	Purpose	Regulating Agency	Permit or Approval	Schedule and Status of Permit	Conformance (Section)
Conformity Regulations, 40 CFR 51, Subpart W, Sections 51.851- 51. 860	Determine that nonattainment and maintenance criteria pollutant emissions resulting from a Federal action conform to applicable state Implementation Plan.	ICAPCD with EPA oversight.	ATC.	Agency approval to be obtained before start of construction.	
State					
H&SC §44300-44384; California Code of Regulations (CCR) §93300-93347 (Toxic "Hot Spots" Act)	Requires preparation and biennial updating of facility emission inventory of hazardous substances; risk assessments.	ICAPCD with CARB oversight.	ATC.	HRA included in EIR.	TBC
Local					
ICAPCD Rule 207 - New and Modified Stationary Source Review	NSR and PSD: Requires that preconstruction review be conducted for all proposed new or modified sources of air pollution, including BACT, emissions offsets, and air quality impact analysis.	ICAPCD with CARB oversight.	ATC.	Agency approval to be obtained before start of construction.	TBC
ICAPCD Rule 900 - Procedures for Issuing Permits to Operate for Sources Subject to Title V of the Federal Clean Air Act Amendments of 1990	Implements operating permits requirements of CAA Title V.	ICAPCD with EPA oversight.	Issues Title V permit after review of application.	Not needed.	--

Table 3.8-2

Laws, Regulations, Standards And Permits For Protection Of Air Quality

Law, Regulation or Standard	Purpose	Regulating Agency	Permit or Approval	Schedule and Status of Permit	Conformance (Section)
Local (Cont'd)					
ICAPCD Rule 400 - Fuel Burning Equipment	Limits emissions of sulfur compounds, NOx, and combustion contaminants.	ICAPCD with ARB oversight.	ATC.	ATC approval precedes construction.	TBC
ICAPCD Rule 401 - Opacity of Emissions	Limits visible emissions to no darker than Ringelmann No. 1 for periods greater than 3 minutes in any hour.	ICAPCD with ARB oversight.	ATC.	ATC approval precedes construction.	TBC
ICAPCD Rule 403 - Quantity of Emissions	Limits emissions of air contaminants from any single processing unit source.	ICAPCD with ARB oversight.	ATC.	ATC approval precedes construction.	TBC
ICAPCD Rule 404 - Particulate Matter	Limits PM emissions.	ICAPCD with ARB oversight.	ATC.	ATC approval precedes construction.	TBC
ICAPCD Rule 405 - Sulfur Compounds	Limits SO_2 emissions to <2,000 ppmv.	ICAPCD with ARB oversight.	ATC.	ATC approval precedes construction.	TBC
ICAPCD Rule 406 - Specific Contaminants	Limits combustion particulate concentration at discharge point.	ICAPCD with ARB oversight.	ATC.	ATC approval precedes construction.	TBC
ICAPCD Rule 407 - Nuisances	Prohibits emissions that annoy or adversely affect public health, safety, other businesses, or property.	ICAPCD with ARB oversight.	ATC.	ATC approval precedes construction.	TBC
ICAPCD Rule 216 - Construction or Reconstruction of Major Stationary Sources That Emit Hazardous Air Pollutants	Requires T-BACT for major sources.	ICAPCD with ARB oversight.	ATC.	ATC approval precedes construction.	TBC

Table 3.8-2

Laws, Regulations, Standards And Permits For Protection Of Air Quality

Law, Regulation or Standard	Purpose	Regulating Agency	Permit or Approval	Schedule and Status of Permit	Conformance (Section)
Local (Cont'd)					
ICAPCD Rule 925- General Conformity	Determine that nonattainment and maintenance criteria pollutant emissions resulting from a Federal action conform to applicable State Implementation Plan.	ICAPCD with EPA oversight.	ATC.	ATC approval precedes construction.	TBC

Source: TRC, 2000.

Table 3.8-3

Ambient Air Quality Standards
Mesquite Mine Expansion

Pollutant	Averaging Time	California Standards (CAAQS)(1)		National Standards (NAAQS)(2)		
		Concentration(3)	Method(4)	Primary(3)(5)	Secondary (3)(4)(6)	Method(7)
O_3	1 Hour	90 ppbv (180 µg/m^3)	Ultraviolet Photometry	120 ppbv (235 µg/m^3)	Same as Primary Standards	Ethylene Chemiluminescence
	8 Hour	–	–	0.08 ppmv (3-year average of annual 4th-highest daily maximum)	–	
CO	8 Hour	9 ppmv (10 mg/m^3)	Nondispersive Infrared Spectroscopy (NDIR)	9 ppmv (10 mg/m^3)	–	NDIR
	1 Hour	20 ppmv (23 mg/m3)		35 ppmv (40 mg/m^3)		
NO_2	Annual Average	–	Gas Phase Chemiluminescence	53 ppbv (100 µg/m^3)	Same as Primary Standards	Gas Phase Chemiluminescence
	1 Hour	250 ppbv (470 µg/m^3)		–		
SO_2	Annual Average	–	Ultraviolet Fluorescence	30 ppbv (80 µg/m^3)	–	Pararosoaniline
	24 Hour	50 ppbv (131 µg/m^3)(8)		140 ppbv (365 µg/m^3)	–	
	3 Hour	–		–	500 ppbv (1,300 µg/m^3)	
	1 Hour	250 ppbv (655 µg/m^3)		–	–	
PM_{10}	Annual Geometric Mean	30 µg/m^3	Size Selective Inlet High Volume Sampler and Gravimetric Analysis	–	–	Inertial Separation and Gravimetric Analysis
	24 Hour	50 µg/m^3		150 µg/m^3	Same as Primary Standards	
	Annual Arithmetic Mean	–		50 µg/m^3		
$PM_{2.5}$	Annual Arithmetic Mean	–	–	15 µg/m^3 (3-year average)	–	
	24 Hour	–	–	65 µg/m^3 (3-year average of 98th percentiles)		
SO_4	24 Hour	25 µg/m^3	Turbidimetric Barium Sulfate	–	–	–
Pb	30 Day Average	1.5 µg/m^3	Atomic Absorption	–	–	Atomic Absorption
	Calendar Quarter	–		1.5 µg/m^3	Same as Primary Standards	
H_2S	1 Hour	30 ppbv (42 µg/m^3)	Cadmium Hydroxide	–	–	–
Vinyl Chloride (chloroethene)	24 Hour	10 ppbv (26 µg/m^3)	Tedlar Bag Collection, Gas Chromatrography	–	–	–
Visibility Reducing Particles	8 Hour (10:00 a.m. to 6:00 p.m. PST)	Insufficient amount to produce an extinction coefficient of 0.23 per kilometer due to particles when the relative humidity is less than 70 percent. (8)	CARB Method V.	–	–	–

WP2/Gold Fields/99-116 (11/5/99/mc)

(1) California standards for O_3, CO, SO_2 (1 hour), NO_2, PM_{10}, and visibility reducing particles are not to be equaled or exceeded.
(2) National standards, other than O_3 (8-hour), $PM_{2.5}$ (24-hour), and those based on annual averages or arithmetic means, are not to be exceeded more than once a year. The O_3 standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above the standard is equal to or less than one.
(3) Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 mm mercury (1,013.2 millibar). Parts per million by volume = ppmv, and parts per billion by volume = ppbv.
(4) Equivalent procedure, which can be shown to satisfy CARB by providing equivalent results at or near the level of the air quality standard, may be used.
(5) National Primary Standards: The levels of air quality necessary, with an adequate margin of safety, to protect public health. Each state must attain the primary standards no later than three years after that state's implementation plan is approved by EPA.
(6) National Secondary Standards: The levels of air quality necessary to protect public welfare from any known or anticipated adverse effect of a pollutant. Each state must attain the secondary standards within a "reasonable time" after the state implementation plan is approved by EPA.
(7) Reference method as described by EPA. An "equivalent method" of measurement may be used, but must have a "consistent relationship to the reference method" and must be approved by EPA.
(8) This standard is intended to limit the frequency and severity of visibility impairment due to regional haze and is equivalent to 10-mile nominal visual range when relative humidity is less than 70 percent.
Source: TRC, 2000.

be developed by state and local air pollution control agencies to review new and modified stationary sources, and require offsets, if needed.

Ambient air quality standards consist of two parts: an allowable concentration of a pollutant, and an averaging time over which the concentration is measured. Allowable concentrations are based on the results of studies of the effects of the pollutants on human health, test animals, crops and vegetation, and, in some cases, damage to paint and other materials. The averaging times are based on whether the damage caused by the pollutant is more likely to occur during exposures to a high concentration for a short time (e.g., 1 hour), or to a low concentration over a longer period (e.g., 1 year). For some pollutants there is more than one air quality standard, reflecting both its short-term and long-term effects.

EPA's new NAAQS for ozone and fine particulate matter went into effect on September 16, 1997. For ozone, the previous 1-hour average standard of 0.12 parts per million by volume (ppmv) was replaced by an 8-hour average standard of 0.08 ppmv. Compliance with this standard is based on the 3-year average of the annual fourth-highest daily maximum 8-hour average concentration measured at each monitor within an area.

The NAAQS for particulates were revised in several respects. First, compliance with the current 24-hour PM_{10} standard will now be based on the 99th percentile of 24-hour concentrations at each monitor within an area. Two new $PM_{2.5}$ standards were added: a standard of 15 micrograms per cubic meter ($\mu g/m^3$), based on the 3-year average of annual arithmetic means from single or multiple monitors (as available); and a standard of 65 $\mu g/m^3$, based on the 3-year average of the 98th percentile of 24-hour average concentrations at each monitor within an area. EPA is delaying implementation of the new standards for an interim period to establish $PM_{2.5}$ monitoring networks, designate areas and develop control strategies. The EPA currently has very little data on which to establish the air quality status of areas with regard to $PM_{2.5}$. The previous PM_{10} status for an area will continue to apply until new data become available.

On May 14, 1999, a three-judge panel of the U.S. Court of Appeals for the District of Columbia set aside the new ozone and particulate matter (PM) standards that the EPA issued in 1997. The Court removed the revised federal standard for PM_{10}, put a hold on implementing the 8-hour ozone standard, and asked for further comments on the $PM_{2.5}$ standard.

California has taken the following position in this unresolved situation. The 8-hour ozone standard will remain in place. However the Court did prohibit EPA from enforcing this standard. In addition, the previously existing 1-hour ozone standard will continue to apply in areas that have not attained that standard (e.g., Imperial County). Although the court removed the new PM_{10} standard, the previously existing PM_{10} standard will continue to apply.

California's state standards continue to apply. Because most Californians live in areas that still exceed the federal 1-hour ozone standard and the state's 1-hour ozone standard, CARB will continue to implement existing programs and pursue new emission reduction measures to meet those standards. Title II of the CAAA contains highway and off-road provisions relating to mobile sources. Vehicles

are subject to increasingly stricter emission limitations on NO_x, nonmethane hydrocarbons, and CO. Diesel fuel for highway vehicles is required to have a sulfur content less than 0.05 percent.

Regulations (Title 40, CFR Part 51, Subpart W, Sections 51.853 through 51.860) require the Federal agency proposing an action having air emissions to make a determination of conformity with the State Implementation Plan (SIP). Conformity can be determined on the basis that net total emission changes (increases and decreases) will be less than specified thresholds (Section 51.853(b)) for each nonattainment and maintenance area criteria pollutant.

EPA has promulgated the following stationary source regulatory programs to implement the requirements of the CAA as related to mining:

- New Source Review (NSR)
- Prevention of Significant Deterioration (PSD)
- New Source Performance Standards (NSPS)
- National Emission Standards for Hazardous Air Pollutants (NESHAP)
- Title V: Operating Permits

New Source Review

- Authority: Clean Air Act §171-193, 42 USC §7501 et req.; Code of Regulations (CFR), Title 40, Parts 51 and 52.
- Purpose: Requires preconstruction review and permitting of new or modified major stationary sources of air pollution to allow industrial growth without interfering with the attainment of ambient quality standards. NSR applies to pollutants for which ambient concentration levels exceed the corresponding NAAQS (i.e., nonattainment pollutants). New and modified stationary sources must be reviewed to assure that their permitting does not prevent or delay bringing federal nonattainment areas into attainment. This review requires that new emissions proposed for a nonattainment criteria pollutant or its precursors from a stationary source cannot be permitted without elimination of at least an equal amount of the same pollutant or its precursors through offsets. The offset required usually increases with the distance between the proposed and reduced sources. Offsets are intended to assure that no net increase occurs.
- Administering Agency: ICAPCD with EPA Region 9 oversight.

Prevention of Significant Deterioration (PSD) Program

- Authority: Clean Air Act §160-169A, 42 USC §7470-7491; 40 CFR Parts 51 and 52.

- Purpose: Requires preconstruction review and permitting of new or modified major stationary sources of air pollution to prevent significant deterioration of ambient air quality. PSD applies to pollutants for which ambient concentrations do not exceed the corresponding NAAQS (i.e., attainment pollutants). The PSD program allows new sources of air pollution to be constructed, or existing sources to be modified, while preserving the existing ambient air quality levels, protecting public health and welfare, and protecting Class I areas (e.g., national parks and wilderness areas).

- A PSD review for the Proposed Action by the U.S. EPA is not required if the emission rate of each attainment pollutant from a new major stationary source or a major modification to an existing major stationary source would be less than the threshold of 250 tons per year (40 CFR, Section 52.21). The Proposed Action does not qualify as either a new major stationary source or as a major modification. Hence, a PSD review is not needed. Class I areas will not need to be identified, and a PSD permit will not be required.

- Administering Agency: ICAPCD, with EPA Region 9 oversight.

New Source Performance Standards

The Mesquite mine is potentially subject to Standards of Performance for Metallic Mineral Processing Plants (Subpart LL of Part 60 in CFR Title 40), depending on the specific pieces of equipment and processes used in the existing operation. The inapplicability of this regulation is discussed under the local air district rules.

Another potentially applicable NSPS is that for the diesel fuel and gasoline storage tanks as follows:

Standards of Performance for Volatile Organic Liquid Storage Vessels

- Authority: Clean Air Act § 171-193, 42 U.S. C. 7401-7601, Code of Regulations (CFR), Title 40, part 60, Subpart Kb
- Purpose: Requires storage vessels containing volatile organic liquids, for which construction, reconstruction, or modifications commenced after July 24, 1984, to be equipped with emission controls to prevent the escape of volatile organic vapors or gases to the atmosphere. Emission controls include mechanical devices, seals, closed vent systems and closure devices that contain or collect VOC vapors and gases potentially discharged from the tank to the atmosphere. This regulation also requires specific testing, inspections, and measurements and operations monitoring be performed routinely on the tank and emissions controls. Recordkeeping and reporting requirements are also included in this subpart.
- Administering Agency: ICAPCD with EPA Region 9 oversight.

National Emission Standards for Hazardous Air Pollutants (NESHAP)

The USEPA has promulgated at least 22 NESHAPs for specific industries and emissions, which are contained in 40 CFR Part 61. None of these NESHAPs apply to the Mesquite Mine.

Title V - Operating Permits Program

- Authority: Clean Air Act §501 (Title V), 42 USC §7661; 40 CFR Part 70.
- Purpose: Requires the issuance of operating permits that identify all applicable federal performance, operating, monitoring, recordkeeping, and reporting requirements. Title V applies to major facilities, Phase II acid rain facilities, subject solid waste incinerator facilities, and any facility listed by EPA as requiring a Title V permit.
- Administering Agency: ICAPCD with EPA Region 9 oversight.

State

The California Air Resources Board (CARB) was created in 1968 by the Mulford-Carrell Air Resources Act. CARB's responsibilities are to develop, adopt, implement, and enforce the state's motor vehicle pollution control program; to administer and coordinate the state's air pollution research program; to adopt and update, as necessary, the state's ambient air quality standards; to review the operations of the local air pollution control districts; and to review and coordinate preparation of the SIP for achievement of the NAAQS.

State Implementation Plan

- Authority: Health & Safety Code (H&SC) §39500 et seq.
- Purpose: Required by the federal Clean Air Act, the SIP must demonstrate the means by which all areas of the state will attain NAAQS within the federally-mandated deadlines. CARB reviews and coordinates preparation of the SIP. Local districts must adopt new rules, or revise existing rules, and demonstrate that the resulting emission reductions, in conjunction with reductions in mobile source emissions, will result in the attainment of NAAQS. Relevant District Rules and Regulations that have also been incorporated into the SIP are discussed in Section 3.1.8.2.1.3.
- Administering Agency: ICAPCD, with CARB and EPA Region 9 oversight.

California Clean Air Act

- Authority: H&SC §40910 - 40930.
- Purpose: Established in 1989, the California Clean Air Act requires local districts to attain and maintain both national and state ambient air quality standards at the "earliest practicable date." Local districts must prepare air quality plans demonstrating the means by which the ambient air

quality standards will be attained. The Imperial County Air Quality Attainment Plan is discussed in Section 3.1.8.2.1.3.

- Administering Agency: ICAPCD, with CARB oversight.

Toxic Air Contaminant Program

- Authority: Assembly Bill (AB) 1809, H&SC §39650 - 39675.

- Purpose: Established in 1983, the Toxic Air Contaminant Identification and Control Act created a two-step process to identify toxic air contaminants and control their emissions. CARB identifies and prioritizes the pollutants to be considered for identification as toxic air contaminants. CARB assesses the potential for human exposure to a substance while the Office of Environmental Health Hazard Assessment (OEHHA) evaluates the corresponding health effects. Both agencies collaborate in the preparation of a risk assessment report that concludes whether a substance poses a significant health risk and should be identified a toxic air contaminant. In 1993, the Legislature amended the program to identify the 189 federal hazardous air pollutants as toxic air contaminants. CARB reviews the emission sources of an identified toxic air contaminant and develops, if necessary, air toxics control measures to reduce the emissions. No air toxics control measures adopted via the Toxic Air Contaminant Program are applicable to the Proposed Action.

- Administering Agency: ICAPCD, with CARB oversight.

Air Toxic "Hot Spots" Act

- Authority: AB 2588, CA Health & Safety Code §44300-44384; 17 CCR §93300-93347.

- Purpose: Established in 1987, the Air Toxics "Hot Spots" Information and Assessment Act supplements the toxic air contaminant program by requiring the development of a statewide inventory of air toxic emissions from stationary sources. The program requires affected facilities to prepare (1) an emissions inventory plan that describes how relevant air toxics and sources of air toxics emissions will be identified and emission rates will be quantified; (2) an emissions inventory report quantifying air toxics emissions; and (3) a health risk assessment, if necessary, to characterize the health risks to the exposed public. Facilities whose air toxics emissions are deemed to pose a significant health risk must issue notices to the exposed population. In 1992, the Legislature amended the program to further require facilities whose air toxics emissions are deemed to pose a significant health risk to implement management plans to reduce the associated risks. This program is implemented at the local level with state oversight.

- Administering Agency: ICAPCD, with CARB oversight.

The California Clean Air Act established ambient air quality standards (CAAQS) as summarized in Table 3.8-3. The state standards are stricter than the NAAQS, and also cover sulfate, hydrogen sulfide (H_2S), vinyl chloride, and visibility.

CARB is responsible for enforcing state air pollution regulations, but delegates the actual rule-making, permitting and enforcement activities for stationary sources to 35 local districts. The California Clean Air Act recognized that transported emissions and atmospheric chemical reactions affect, and may even dominate, the air quality in downwind air basins. CARB (1989) identified SOCAB and the San Joaquin Valley Unified Air Basin as areas of origin for the transport of ozone and its precursors into Coachella Valley and Imperial County (combined into Salton Sea Air Basin), and listed San Diego County and Mexicali as potential source areas for transport impacts. Additional responsibilities of CARB that are applicable to the analysis performed for the Proposed Action include:

- Requiring local districts to develop plans to attain CAAQS.
- Establishing state emission standards for on-highway, gasoline-powered mobile sources, and the sulfur content of diesel fuel.

Local (Imperial County Air Pollution Control District)

When the state's air pollution statutes were reorganized in the mid-1960s, local districts were required to be established in each county of the state. There are three different types of districts: county, regional and unified. Local districts have principal responsibility for the following:

- Develop plans to meet the CAAQS and NAAQS.
- Develop non-vehicular source control measures needed to achieve and maintain these standards.
- Implement permit programs established for the construction, modification, and operation of stationary sources of air pollution.
- Enforce air pollution statutes and regulations governing nonvehicular sources.
- Develop employer-based trip reduction programs.

Imperial County has experienced exceedances of both the federal ozone NAAQS (0.12 ppmv for 1 hour), and the stricter ozone CAAQS (0.09 ppmv for 1 hour) and hence, is nonattainment of both standards as shown in Table 3.8-4. The county is also nonattainment of both national and state standards for PM_{10}.

PM_{10} is emitted directly by sources and is created indirectly in the atmosphere from chemical reactions that convert NO_x, ROC and SO_x gaseous precursors into small particles. Sources of PM_{10} are both natural, and related to human activities (anthropogenic). Anthropogenic sources include pointsources (smoke stacks), stationary area sources (empty agricultural land), mobile source exhaust,

Table 3.8-4

Attainment Status Of Imperial County Mesquite Mine Expansion

Criteria Pollutant	Attainment Classifications		Precursor Emission
	CAAQS	NAAQS	
O_3	Nonattainment, Moderate	Transitional	NO_X, ROC
NO_2	Attainment	Unclassified	NO_X
PM_{10}	Nonattainment	Moderate	NO_X, ROC, SO_X
SO_2	Attainment	Attainment	SO_X
Sulfate	Attainment	NA	SO_X
CO	Unclassified	Unclassified	NA
Lead (particulate)	Attainment	–	–
Hydrogen Sulfide (H_2S)	Unclassified	–	–
Visibility-Reducing Particles	Unclassified	–	NO_X, ROC, SO_X

Source: TRC, 2000.

and fugitives (e.g., dust from the wheels of a truck). NO_2 and SO_2 must be evaluated as both attainment and nonattainment pollutants because they are criteria pollutants and precursors.

Part of the ozone in Imperial County is transported from other areas, causing some of the exceedances of the state standard. A portion of the ozone in Imperial County is transported from SOCAB , according to CARB (1989, 1993b and 1996). Back-trajectories track SOCAB emissions all the way to Imperial County. CARB (1993a) states that Mexico is also a source of the ozone and precursors transported into Imperial County, which are monitored at Calexico-Grant and El Centro. Such transport means that control of ozone in Imperial County needs to be coordinated with the control of ozone in the SOCAB and Mexico, especially Mexicali (just across the international border from Calexico). Such coordinated control will most likely delay attainment of the CAAQS for ozone in Imperial County to beyond 2010, when SCAQMD proposes to reduce emissions in SOCAB enough to attain the federal ozone standard. Even then, the ozone CAAQS may not be attained in Imperial County if Mexicali sources of ozone precursors are not sufficiently controlled by that time.

The existing air quality control permit (Authority to Construct/Permit to Operate) from the ICAPCD would be amended to incorporate changes associated with the Proposed Action.

Imperial County Air Quality Attainment Plan (Plan)

- Authority: H&SC §40000 et seq.
- Purpose: The Plan defines the proposed strategies, including stationary source control measures and NSR rules, whose implementation will attain the CAAQS. The Plan was designed to reduce emissions of nonattainment pollutants in Imperial County by the required 5 percent per year. The relevant stationary source control measures and NSR requirements are discussed below.
- Administering Agency: ICAPCD, with CARB oversight.

Imperial County Air Pollution Control District Rules and Regulations

- Authority: H&SC §40000 – 40104.
- Purpose: Establish procedures, exemptions, standards for issuing permits, requirements (control, monitoring, recordkeeping and reporting), and emission limitations on a source-specific basis.
- Administering Agency: ICAPCD with CARB and EPA Region 9 oversight.

3.8.2.3 Summary of Applicable Requirements

This section summarizes applicable federal, state, and local air pollution requirements.

New and Modified Stationary Source Review (Rule 207)

Rule 207 combines into a single rule the more stringent requirements of the federal PSD and NSR programs, as well as the NSR requirements of the California Clean Air Act. The rule contains the following requirements:

- BACT
- Offsets
- Air Quality Impact Analysis

Best Available Control Technology

BACT for each specific pollutant must be applied to a new or modified stationary emissions unit that has the potential to emit at or above the threshold rates shown in Table 3.8-5.

The District defines BACT as follows:

- Most effective emission control device emission limit, or technique which has been required and used for such class or category of source unless the applicant demonstrates to the satisfaction of the Air Pollution Control Officer that such limitations required on other emissions units have not been demonstrated to be achievable.

- Any other alternative emission control device, emission control technique, basic equipment determined to be technologically feasible and cost-effective by the Air Pollution Control Officer.

- Under no circumstances shall BACT be determined to be less stringent than the emission control required by any applicable provision of laws or regulations of the District, State and federal government, or State Implementation Plan, unless the applicant demonstrates to the satisfaction of the Air Pollution Control Officer that such limitations are not technologically achievable.

- In no event shall the application of BACT result in the emission of any pollutant at a rate that exceeds an applicable New Source Performance Standard (40 CFR, Part 60) or National Emission Standard for Hazardous Air Pollutants (40 CFR, Part 61).

BACT determinations are made by the District on a case-by-case basis.

Emission Offsets

For a new or modified facility, any emission increase greater than 137 lbs/day must be offset.

- Offsets for increases in carbon monoxide emissions in attainment areas shall not be required if the applicant, using air quality dispersion modeling analysis, demonstrates to the satisfaction of the Air Pollution Control Officer that carbon monoxide ambient air quality standards would not be violated in the areas to be affected.

Table 3.8-5
ICAPCD BACT Emission Rate Thresholds

Pollutant	Threshold (Lb./day)
NO_x	25
SO_x	25
ROC	25
CO	550
H_2S	55
Total Reduced Sulfur Compounds	55
PM_{10}	25
Lead	3.3
Asbestos	0.4
Beryllium	0.0022
Mercury	0.55
Vinyl Chloride	5.5
Fluoride	16
Sulfuric Acid Mist	38

Source: TRC, 2000.

Emissions must be offset at the following ratios:

- 1:1 within the same source.
- 1.2:1 within 50 miles of the source.
- To be determined within the range of 1.2:1 and 3:1 by the Air Pollution Control Officer for offset sources more than 50 miles from the proposed source and within the same air basin.

Air Quality Impact Analysis

Dispersion of air emissions must be analyzed with an EPA-approved model to demonstrate that AAQS will not be exceeded, nor will an existing exceedance be made worse.

Noncriteria Pollutant New Source Review

District Rule 216 requires major sources of noncriteria pollutants (also called toxic air contaminants or hazardous air pollutants [HAP]) to install toxics-BACT (T-BACT). Major source is defined in federal regulation 40 CFR Section 6341 as a new process or production unit, fabricated, erected or installed at a developed site, which in and of itself emits or has the potential to emit 10 tons per year (tpy) of any HAP or 25 tpy of any combination of HAPs.

The District requests that health risk be assessed according to generally accepted guidance (e.g., CAPCOA, 1993). Guideline limits include a carcinogenic risk from Proposed Action emissions of 10-in-one-million, and health hazard indices (chronic and acute)(1)(2) of 1.0.

Federal Operating Permit (Title V)

District Rule 900 (Procedures for Issuing Permits to Operate for Sources Subject to Title V of the Federal Clean Air Act Amendments of 1990) requires major facilities and facilities subject to Clean Air Act Title IV (i.e., Acid Rain facilities) to obtain an operating permit containing federally enforceable requirements. An application, if required, must describe all processes, applicable regulations, estimated direct and fugitive emissions, required methods for determining compliance, associated operating conditions, air pollution control equipment, and a facility compliance plan.

A detailed emission inventory contained in TRC (1996), and the similarly detailed emission inventory contained in the air quality impact analysis herein, indicate that the Mesquite Mine Expansion does not require a Title V permit.

- Chronic health hazard index is the sum of the health hazard index for each chronic non-criteria pollutant listed in CAPCOA (1993). The chronic health hazard index for a specific noncriteria pollutant equals the maximum annual concentration of the pollutant at or beyond the property line divided by the reference exposure level (REL) in CAPCOA (1993).
- Acute health hazard index is the sum of the health hazard index for each acute noncriterion pollutant listed in CAPCOA (1993). The acute health hazard index for a specific acute noncriteria pollutant equals the maximum 1-hour concentration of the pollutant at or beyond the property line divided by the acute REL in CAPCOA (1993).

New Source Performance Standards (NSPS)

No NSPS are applicable to the mining and processing of gold-bearing ore. District Rule 1101 incorporates the federal NSPS and regulations from 40 CFR Part 60. As mentioned above in the discussion of federal regulations and standards, Subpart LL of 40 CFR Part 60 contained Standards of Performance for Metallic Mineral Processing Plants. The Mesquite Mine has a metallic mineral (gold) processing plant, but not the following "...affected facilities..." listed in Section 60.380 of Subpart LL:

- Crusher and screen in open-pit mines
- Mill or concentrator facilities (i.e.):
  - crusher, screen, bucket elevator, conveyor belt transfer point,
  - thermal dryer, product packaging station, storage bin,
  - enclosed storage area, truck loading station, truck unloading station, rail car loading station, rail car unloading station,

Therefore, the NSPS is not applicable to the existing Mesquite Mine or Proposed Action.

Applicability of 40 CFR Part 60, Subpart Kb

40 CFR 60, Subpart Kb is applicable to facilities with any volatile organic liquid-containing vessel with a capacity greater than or equal to 40 cubic meters (10,568 gallons) for which construction, reconstruction, or modifications commenced after July 24, 1984.

Construction, reconstruction or modifications of the storage tanks at Mesquite Mine occurred before July 24, 1984. Based upon this requirement alone, this Subpart is not applicable. Further, the tanks at the Mesquite Mine are exempt from the requirements of this Subpart, based upon subparagraphs 60.110b (b) and (c), as summarized below, respectively:

- 40 CFR 60, Subpart Kb Section 60.110b (b) storage vessel with a design capacity less than 75 cubic meters (19, 815 gallons)

- 40 CFR 60, Subpart Kb Section 60.110b (c) storage vessel with design capacity greater than or equal to 151 cubic meters containing a liquid with a maximum true vapor pressure less than 3.5 kilo Pascals (kPa.)

- 40 CFR 60, Subpart Kb Section 60.110b (c) storage vessel with design capacity greater than or equal to 75 m3 (19815 gallons), but less than 151 cubic meters (39,895 gallons) containing a liquid with a maximum true vapor pressure less than 3.5 kPa.

National Emission Standards for Hazardous Air Pollutants (NESHAPs)

No NESHAPs are applicable to the mining and processing of gold-bearing ore.

ICAPCD Prohibitory Rules

The District prohibitory rules applicable to the Proposed Action include:

- Rule 400 - Fuel Burning Equipment: Prohibits emission of sulfur compounds (calculated as SO_2), NO_x (as NO_2), and combustion contaminants (defined in Rule 100) in excess of 200, 140, and 10 pounds per hour, respectively.

- Rule 401 - Opacity of Emissions: Prohibits air contaminant emissions as dark or darker than Ringelmann Chart No. 1 for periods greater than three minutes in any hour.

- Rule 403 - General Limitations on the Discharge of Air Contaminants: Prohibits emissions of air contaminants, combustion contaminants, and particulate matter from any single emissions unit in excess of specified rates based on process rate by weight, volume, rate of discharge, or concentration in discharge gas.

- Rule 404 - Particulate Matter Emissions-Process Weight: Prohibits particulate emissions in excess of tabulated rates in pounds per hour for specified process rates in pounds per hour.

- Rule 405 - Sulfur Compounds: Prohibits sulfur compound emissions, calculated as SO_2, in excess of 0.2 percent by volume (2,000 ppmv) from a single source.

- Rule 406 - Specific Contaminants: Prohibits discharge from a single source of combustion particulate concentration in excess of 0.2 grains per standard cubic foot of gas, calculated at 12 percent carbon dioxide.

- Rule 407 - Nuisances: Prohibits the discharge from a facility of air contaminants that cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health or safety of any such persons or the public or which cause or have a natural tendency to cause injury or damage to business or property.

Authority to Construct

Rule 201 (Permits Required) specifies that a person "constructing, erecting, installing, modifying, or replacing any article, machine, equipment or contrivance, the use of which may emit or control air contaminants, shall first obtain written authorization for such construction from the Control Officer, except as may be exempted herein."

Conformity

ICAPCD Rule 925 contains virtually identical language as the Federal conformity regulations in Title 40, CFR Part 51, Subpart W, Sections 51.853 through 51.860. Similarly, Rule 925 requires the Federal agency proposing an action having air emissions to make a determination of conformity with the SIP. Conformity can be determined on the basis that net total emission changes (increases and decreases) will be less than specified thresholds (Section D.2 of Rule 925) for each nonattainment and maintenance area criteria pollutant.

3.8.3 Existing Climate and Meteorology

The desert environment is very hot in summer and mild in winter. Humidity is generally low, except in July and August when the monsoon wind blows from the Gulf of California (i.e., from the southeast). Precipitation is low (about 3 inches per year); it occurs mostly during the winter rainy season, while the remainder occurs during the summer monsoon season.

Regional wind direction follows two patterns. From October through May, prevailing winds are from the west and northwest. The humidity is lowest under these conditions. Some of these winds originate in SOCAB, enter the Coachella Valley through the Banning Pass, and travel southeasterly along the Salton Sea Trough.

July and August weather patterns are often dominated by a heating-induced low-pressure area that forms over the hot interior deserts, drawing air from the Gulf of California (southeast of the site) and northern portion of Mexico. The humidity is highest during these conditions. June and September are transition months between the two seasonal patterns.

Wind speeds in the region are sufficiently strong to promote good mixing so that air mass stagnation does not occur. Daytime winds average 9 to 13 mph, are strongest in winter and early spring, and are weakest in fall. Winds at night average 5 to 8 mph, are weakest in late spring, and are strongest in winter.

Vertical mixing and dilution in the area is very good, with afternoon mixing heights reaching at least 10,000 feet above ground in summer. Strong daytime mixing generally disperses nighttime ground-based thermal inversions.

Analysis of wind data from El Centro, Imperial Airport, and Blythe, all in California, and Yuma, Arizona indicate that weather conditions at the mine are generally similar to those in the region. In addition, wind conditions are locally affected by the nearby Chocolate Mountains. Wind data from the existing Mesquite Mine are shown in Figure 3.8-1, and indicate that the wind frequently blows from the north-northeast, west and south. This distribution is based on 1 year of data, extending from April 1, 1991 through March 31, 1992, and measured at the site shown in Figure 3.8-2. Additional wind data, monitored during 1989, were used to verify that the distribution in Figure 3.8-1 is representative for the site.

The regional westerlies are the "normal" flow over the entire region, especially during afternoons when the wind is well developed by daily heating. The southerly flow is associated with the summer monsoon. The north-northeasterly winds are caused by Santa Ana winds coming down from the north, where a high-pressure area typically develops over the deserts in winter. Local topographic conditions steer these winds south along the eastern side of the Chocolate Mountains and through a pass between the southern end of this range and the western side of Quartz Peak.

3.8.4 Existing Air Quality

Monitoring data for criteria pollutants are reviewed, along with resulting attainment designations, to describe existing (background) air quality. Imperial County data from 1996 through 1998 form the basis of this review for ozone, PM_{10}, NO_2, SO_2, and CO, while site data for 1997 through 1999 were available for PM_{10}.

The Mesquite Mine has been operating since 1985. Hence, emissions from existing mobile equipment exhaust, fugitive dust and stationary sources are already accounted for in the monitored ambient concentrations (i.e., background).

3.8.4.1 Ozone

Ozone is generated by a complex series of chemical reactions between ROC and NO_x in the presence of ultraviolet radiation. ROC and NO_x emissions from vehicles and stationary sources, in combination with daytime wind flow patterns, mountain barriers, a persistent temperature inversion, intense sunlight, and high ambient temperature cause high ozone concentrations.

Ozone is monitored at the following six locations in Imperial County:

- Calexico – East
- Calexico - Ethel Street
- Calexico - Grant Street
- El Centro - 9th Street
- Niland - English Road
- Westmoreland - West 1st Street

Maximum ozone concentrations measured at these locations during each of the three previous years are shown in Table 3.8-6, along with the annual number of days that exceed AAQS. These exceedances result in the state and federal nonattainment status shown in Table 3.8-4.

During one year from May 21, 1992 through May 31, 1993, ozone was continuously monitored at the Mesquite Mine well field located south of the mine. Ozone concentration exceeded the 90 ppbv 1-hour CAAQS twice, reaching 100 ppbv at 4:00 p.m. on April 28, 1993 and 94 ppbv at 9:00 a.m. on August 15, 1993 (Table 3.8-7). The ozone concentration equaled the 90 ppbv CAAQS at 9:00 a.m. on July 17, 1992. Each time, the wind was blowing from the southwest.

3.8.4.2 Nitrogen Dioxide

Nitrogen oxides are primarily generated from the combustion of fuels. Nitrogen oxides include nitric oxide (NO) and NO_2. Because NO converts to NO_2 in the atmosphere and NO_2 is more toxic, NO_2 is the criteria pollutant. Control of NO_2 is also important because of its role in the formation of ozone.

Table 3.8-6

Ozone Concentrations in Imperial County 1996-1998

Parameter	Location	1996	1997	1998
Maximum 1-Hour Concentration (parts per million by volume, ppmv)	Calexico- East	0.162	0.121	0.123
	Calexico- Ethel Street	0.146	0.156	0.139
	Calexico- Grant Street	0.180	0.160	0.070
	El Centro- 9th Street	0.140	0.130	0.110
	Niland- English Road	--	0.100	0.110
	Westmorland- W 1st Street	--	--	0.120
Maximum 8-Hour Concentration (parts per million by volume, ppmv)	Calexico- East	0.117	0.092	0.101
	Calexico- Ethel Street	0.109	0.101	0.104
	Calexico- Grant Street	0.103	0.120	0.051
	El Centro- 9th Street	0.113	0.111	0.087
	Niland- English Road	--	0.070	0.100
	Westmorland- W 1st Street	--	--	0.096
Number of Days Exceeding 1-Hour CAAQS (0.09 ppmv)	Calexico- East	22	6	19
	Calexico- Ethel Street	44	24	23
	Calexico- Grant Street	19	55	0
	El Centro- 9th Street	41	29	10
	Niland- English Road	--	1	5
	Westmorland- W 1st Street	--	--	10
Number of Days Exceeding 1-Hour NAAQS (0.12 ppmv)	Calexico- East	3	0	0
	Calexico- Ethel Street	5	4	3
	Calexico- Grant Street	2	8	0
	El Centro- 9th Street	6	2	0
	Niland- English Road	--	0	0
	Westmorland- W 1st Street	--	--	0
Number of Days Exceeding 8-Hour NAAQS (0.08 ppmv)	Calexico- East	12	2	11
	Calexico- Ethel Street	13	8	7
	Calexico- Grant Street	10	46	0
	El Centro- 9th Street	28	11	1
	Niland- English Road	--	0	4
	Westmorland- W 1st Street	--	--	8
Ozone 1-Hour Exceedance "Month"	Calexico- East	June	September	December
	Calexico- Ethel Street	May	September	June
	Calexico- Grant Street	June	July	January
	El Centro- 9th Street	June	June	March
	Niland- English Road	--	October	July
	Westmorland- W 1st Street	--	--	June
Ozone 8-Hour Exceedance "Month"	Calexico- East	June	April	June
	Calexico- Ethel Street	June	June	June
	Calexico- Grant Street	May	July	January
	El Centro- 9th Street	June	May	June
	Niland- English Road	--	October	July
	Westmorland- W 1st Street	--	--	June

Source: TRC, 2000

Table 3.8-7

Ozone Monitoring(1) Mesquite Mine

Month/Year	Concentration (ppbv)	
	Monthly Arithmetic Mean	Maximum 1-Hour
May-92	36	61
Jun-92	43	84
Jul-92	31	90
Aug-92	35	94
Sep-92	35	78
Oct-92	34	76
Nov-92	34	70
Dec-92	29	41
Jan-93	28	47
Feb-93	33	59
Mar-93	39	78
Apr-93	53	100
May-93	49	88
Annual	37	100
CAAQS (1-hour)	90	90

Note: (1) Reference: Table 2.4, Technical Appendix F, BLM and County of Imperial(1994).

Source: TRC, 2000.

Table 3.8-8 shows the maximum 1-hour NO_2 concentrations measured during 1996-1998 at the two monitoring stations in Imperial County, Calexico-East and Calexico-Ethel Street, and the annual arithmetic mean ambient NO_2 level for each of those years. During this period the 1-hour concentrations on one day exceeded the state 1-hour standard (0.25 ppmv). The federal annual average standard (0.053 ppmv) was not exceeded.

NO_2 was measured, along with NO, at the well field as part of the site monitoring program in 1992-1993. The annual arithmetic mean and maximum concentrations were 3 and 39 ppbv, as shown in Table 3.8-9, far below the 53 ppbv annual NAAQS and 0.25 ppmv (250 ppbv) 1-hour CAAQS, respectively.

3.8.4.3 PM_{10}

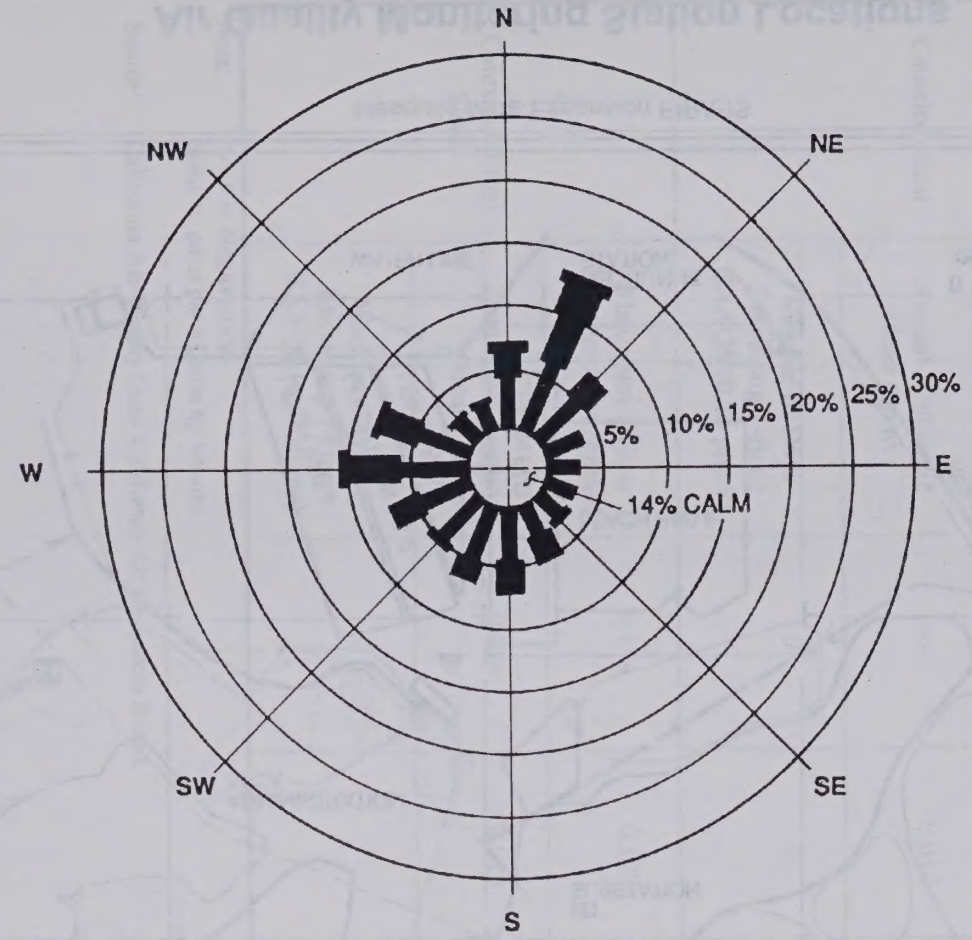
PM_{10} is generated by a combination of wind-blown fugitive dust, particles emitted from combustion sources (usually carbon particles), and organic, sulfate, and nitrate aerosols formed in the air from emitted hydrocarbons, sulfur oxides, and nitrogen oxides, respectively. In 1984 CARB adopted standards for PM_{10} and phased out the total suspended particulate (TSP) standards that had been in effect until then. PM_{10} standards were substituted for TSP standards because PM_{10} corresponds to the size range of inhalable particles related to human health. In 1987, EPA also replaced national TSP standards with PM_{10} standards.

As discussed in Section 3.8.2, the NAAQS for PM_{10} were further revised by EPA with new standards that went into effect on September 16, 1997. The new $PM_{2.5}$ standards, promulgated at the same time, will not require specific actions by facilities because recent court action requested EPA to review the standards further before acting on them.

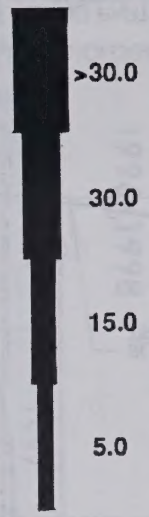
Table 3.8-10 shows the maximum 24-hour average PM_{10} concentrations, and annual geometric and arithmetic means recorded at seven monitoring stations in Imperial County from 1996 through 1998. The number of days exceeding the state and federal standards separately is also shown. These exceedances account for the nonattainment designations shown in Table 3.8-4.

PM_{10} is monitored at four sites around the mine as shown in Figure 3.8-2. The data for 1997-1999 is presented in Table 3.8-11. Although these measurements are not used to determine the attainment status of Imperial County, the number of days AAQS were exceeded at any of these four stations was less than the number of exceedances at any of the seven monitoring stations used by Imperial County (see Table 3.8-10). An improving trend is apparent in both tables. Only the North Boundary monitor had a single exceedance of the 24-hour CAAQS in 1998 and 1999.

Sources of PM_{10} that can influence the concentrations measured at the mine include site activities (e.g., loading, hauling), nearby gravel mining activities (e.g., excavation, loading, hauling), recreational uses at the Algodones Dunes and other desert areas, and dust generation throughout the region when winds are strong. When all four of the monitors show high PM_{10} concentrations, the wind speed was relatively high. Under these conditions, the measured dust concentrations are most likely high throughout the region, not just at the mine.



UPPER BOUND OF WIND SPEED CLASSES (MPH)



AVERAGING TIME: 1 HOUR
MESQUITE, CALIFORNIA
WIND ROSE ANALYSIS
FOR 4/1/91 TO 3/31/92
(PERIOD FOR AIR DISPERSION MODELING)

North

3/14/00

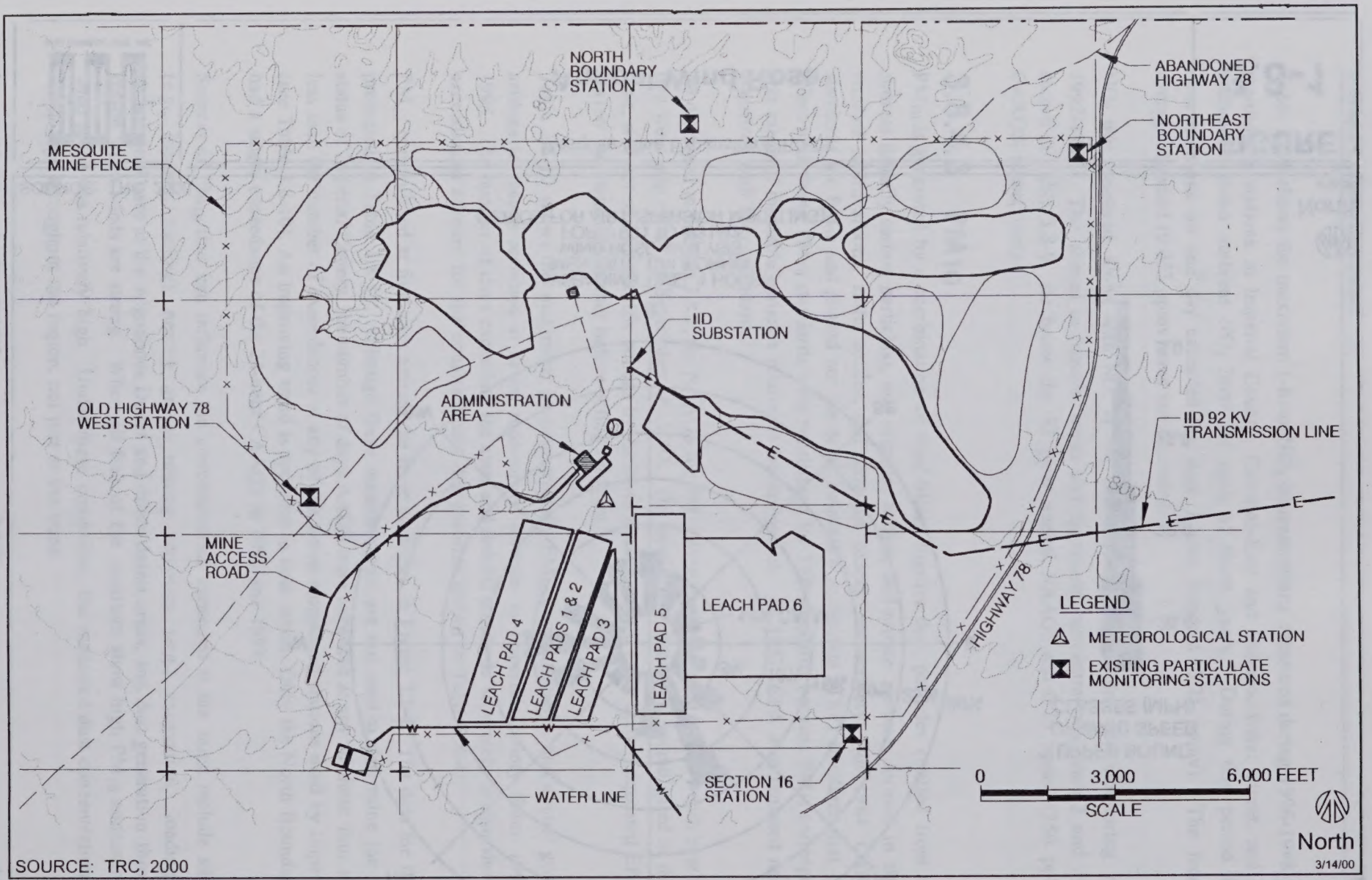
SOURCE: TRC, 2000

BRG CONSULTING, INC.

Mesquite Mine Expansion EIR/EIS

Annual Wind Rose

FIGURE 3.8-1



SOURCE: TRC, 2000

BRG CONSULTING, INC.

Mesquite Mine Expansion EIR/EIS

Air Quality Monitoring Station Locations

FIGURE 3.8-2

Table 3.8-8

Nitrogen Dioxide In Imperial County 1996-1998

Location	Parameters	1996	1997	1998
Calexico- East	Maximum 1-Hour Concentration (ppmv)	0.072	0.091	0.105
	Annual Arithmetic Mean (ppmv)	– –	0.010	0.011
	Number of Days Exceeding 1-Hour CAAQS (0.25 ppmv)	0	0	0
Calexico- Ethel Street	Maximum 1-Hour Concentration (ppmv)	0.164	0.128	0.257
	Annual Arithmetic Mean	0.014	0.015	– –
	Number of Days Exceeding 1-Hour CAAQS (0.25 ppmv)	0	0	1

Note: "– –" = Not available
ppmv = parts per million by volume

Source: California Air Quality Data, California Air Resources Board.

Table 3.8-9

Nitrogen Dioxide Concentration
Mesquite Mine

Month	Year	Concentration (ppbv)	
		Arithmetic Mean	Maximum 1-Hour
May	1992	2	8
June	1992	3	23
July	1992	2	33
August	1992	2	33
September	1992	3	34
October	1992	3	39
November	1992	3	32
December	1992	4	31
January	1993	2	36
February	1993	4	27
March	1993	4	27
April	1993	5	35
May	1993	5	19
Annual	--	3	39
AAQS	--	53 (NAAQS)	250 (CAAQS)

Source: Table 2.4, Technical Appendix F, BLM (1994)

ppbv = parts per billion by volume

Table 3.8-10
PM_{10} Concentrations in Imperial County
1996 - 1998
(micrograms per cubic meter, $\mu g/m^3$)

Year	Parameter	Brawley/ Main Street	Calexico/ East	Calexico/ Ethel Street	Calexico / Grant Street	El Centro/ 9th Street	Niland/ English Road	Westmorland / W 1st Street
1996	Maximum 24-Hour Average	257	441	193	187	359	71	229
	Annual Geometric Mean (CAAQS = 30 $\mu g/m^3$)	41	90	62	63	39	41	42
	Annual Arithmetic Mean (NAAQS = 50 $\mu g/m^3$)	47	109	73	70	48	43	49
Number of Days Exceeding:								
	24-Hour CAAQS (50 $\mu g/m^3$)	22	35	41	34	18	6	20
	24-Hour NAAQS (150 $\mu g/m^3$)	1	8	5	3	1	0	2
1997	Maximum 24-Hour Average	532	199	166	179	120	191	213
	Annual Geometric Mean (CAAQS = 30 $\mu g/m^3$)	42	76	70	62	34	42	36
	Annual Arithmetic Mean (NAAQS = 50 $\mu g/m^3$)	50	86	77	75	38	46	43

Table 3.8-10
PM_{10} Concentrations in Imperial County
1996 - 1998
(micrograms per cubic meter, $\mu g/m^3$)

Year	Parameter	Brawley/ Main Street	Calexico/ East	Calexico/ Ethel Street	Calexico / Grant Street	El Centro/ 9th Street	Niland/ English Road	Westmorland / W 1st Street
Number of Days Exceeding:								
1997 (cont'd.)	24-Hour CAAQS (50 $\mu g/m^3$)	14	49	49	35	9	12	12
	24-Hour NAAQS (150 $\mu g/m^3$)	1	6	2	4	0	1	1
1998	Maximum 24-Hour Average	81	568	160	176	90	75	81
	Annual Geometric Mean (CAAQS = 30 $\mu g/m^3$)	35	79	58	51	29	26	28
	Annual Arithmetic Mean (NAAQS = 50 $\mu g/m^3$)	38	107	66	63	33	30	32
Number of Days Exceeding:								
	24-Hour CAAQS (50 $\mu g/m^3$)	9	44	39	29	9	4	9
	24-Hour NAAQS (150 $\mu g/m^3$)	0	10	1	2	0	0	0

Source: California Air Quality Data, California Air Resources Board

Table 3.8-11

PM_{10}, Mesquite Mine[1], 1997 - 1999

Year	Parameter	Highway 78	NE Boundary	N Boundary	Section 16	Overall [2]
1997	Maximum 24-Hour Average [3]	59.9	139.4	161.1	126.2	161.1
	Annual Geometric Mean (CAAQS = 30 µg/m^3)	18.8	14.5	18.8	17.8	17.3
	Annual Arithmetic Mean (NAAQS = 50 µg/m^3)	22.0	21.7	29.1	23.2	24.0
Number of Days Exceeding:						
	24-Hour CAAQS (50 µg/m^3)	1	2	8	2	8
	24-Hour NAAQS (150 µg/m^3)	0	0	1	0	1
1998	Maximum 24-Hour Average	41.0	40.2	50.4	37.7	50.4
	Annual Geometric Mean (CAAQS = 30 µg/m^3)	13.4	11.6	12.9	12.3	12.6
	Annual Arithmetic Mean (NAAQS = 50 µg/m^3)	16.7	14.7	16.7	15.6	15.9
Number of Days Exceeding:						
	24-Hour CAAQS (50 µg/m^3)	0	1	1	0	1
	24-Hour NAAQS (150 µg/m^3)	0	0	0	0	0
1999	Maximum 24-Hour Average	49.4	42.0	62.2	45.5	62.2
	Annual Geometric Mean (CAAQS = 30 µg/m^3)	14.7	12.8	14.0	14.5	14.7
	Annual Arithmetic Mean (NAAQS = 50 µg/m^3)	17.5	15.8	17.1	16.8	17.5

Table 3.8-11

PM_{10}, Mesquite Mine[1], 1997 - 1999

Year	Parameter	Highway 78	NE Boundary	N Boundary	Section 16	Overall [2]
Number of Days Exceeding:						
1999 (cont'd.)	24-Hour CAAQS (50 µg/m^3)	0	0	1	0	1
	24-Hour NAAQS (150 µg/m^3)	0	0	0	0	0
1997 - 1999	3-year Geometric Mean	15.4	12.9	14.9	14.7	14.4
	3-year Arithmetic Mean	18.6	17.4	20.7	18.5	18.8

Notes:
(1) PM_{10} data from four 24-hour ambient air samplers located at the Mesquite Mine.
(2) The overall maximum 24-hour average equals the highest of the four monitors.
The overall annual means are averaged over all four monitors.

Source: TRC, 2000.

The overall geometric and arithmetic means for the four monitors and the 3 years are 14.4 and 18.8µg/m^3, respectively. These concentrations are only 48 and 38 percent of the annual PM_{10} CAAQS and NAAQS, respectively.

3.8.4.4 Sulfur Dioxide

Sulfur dioxide (SO_2) is produced when any sulfur-containing fuel such as diesel is burned. It is also emitted by chemical plants that treat or refine sulfur or sulfur-containing chemicals. Because of the complexity of the chemical reactions that convert SO_2 to other compounds (such as PM_{10} sulfate), peak concentrations of SO_2 occur at different times of the year in different parts of California, depending on local fuel characteristics, weather, and topography.

SO_2 monitoring data during 1996-1998 are available from the two following stations in Imperial County:

- Calexico-East
- Calexico-Ethel Street

A third monitor at Niland started measuring SO_2 concentrations in mid-June 1998. Table 3.8-12 presents maximum 24-hour and annual arithmetic mean SO_2 concentrations for each station and year. The data show that the maximum 24-hour concentrations are below AAQS.

Annual average SO_2 concentrations at the two sites were always less than one-tenth of the federal annual average standard of 0.03 ppmv. Hence, the region, including the site, is classified as attainment of both CAAQS and NAAQS as shown in Table 3.8-4.

3.8.4.5 Carbon Monoxide

Carbon monoxide is a product of inefficient combustion, principally from automobiles and other mobile sources of pollution. Industrial sources typically contribute less than 10 percent of ambient CO levels. Peak CO levels usually occur during winter months, due to a combination of higher emission rates and stagnant weather conditions.

Table 3.8-13 shows the maximum 8-hour concentrations recorded at the three following monitoring stations during the period 1996-1998:

- Calexico-East
- Calexico-Ethel Street
- El Centro-9th Street

As shown, the maximum recorded concentrations are below AAQS in El Centro, but exceed them in Calexico. Calexico has substantial traffic from across the border in the nearby city of Mexicali. These cars have less emission controls than California cars. Hence, Imperial County is classified as attainment for both CAAQS and NAAQS, except for the area around Calexico.

Table 3.8-12

Sulfur Dioxide Concentrations, Imperial County 1996 - 1998

(Parts Per Million By Volume, ppmv)

Parameter	Location	1996	1997	1998
Maximum 24-Hour Concentration (CAAQS=0.05 ppmv)	Calexico - East	0.034	0.033	0.037
	Calexico - Ethel Street	0.034	0.033	0.037
Annual Arithmetic Mean (NAAQS = 0.03 ppmv)	Calexico - East	0.001	0.001	0.002
	Calexico - Ethel Street	0.003	0.002	0.003
Number of Days Exceeding 24-Hour (CAAQS=0.05 ppmv)	Calexico - East	0	0	0
	Calexico - Ethel Street	0	0	0
Number of Days Exceeding 24-Hour (NAAQS=0.14 ppmv)	Calexico - East	0	0	0
	Calexico - Ethel Street	0	0	0

Source: California Air Quality Data, California Air Resources Board.

Table 3.8-13

Carbon Monoxide Concentration, Imperial County 1996 - 1998

(Parts Per Million By Volume, ppmv)

Parameter	Location	1996	1997	1998
Maximum 8 Hour Concentration	Calexico - East	8.7	16.3	13.0
	Calexico - Ethel Street	22.1	17.8	14.4
	El Centro - 9th Street	6.8	3.7	3.5
Number of Days Exceeding 8-Hour CAAQS (9.0 ppmv) (1)	Calexico - East	0	4	3
	Calexico - Ethel Street	11	13	10
	El Centro - 9th Street	0	0	0
Number of Days Exceeding 8-Hour NAAQS (9 ppmv) (2)	Calexico - East	0	2	3
	Calexico - Ethel Street	9	12	8
	El Centro - 9th Street	0	0	0

Notes:

(1) Exceedance of the state standard is based on concentrations of 9.1 ppmv and greater.

(2) Exceedance of the NAAQS is based on concentrations of 9.5 ppmv and greater.

Source: California Air Quality Data, California Air Resources Board.

3.8.5 Existing Emissions

The mine has been operating since 1985, and it received approval (i.e., permits) to increase production to 60 million tons per year of overburden/interburden and ore in 1996. Assumptions made to calculate the emissions associated with the currently permitted production rate are listed in Table 3.8-14. Production, and hence, emissions associated with operating equipment to achieve production, is permitted on an annual basis. Daily emissions vary because daily activity rates and production are not subject to regulatory limits.

Actual production at the mine has historically been less than permitted production. For example, total production of overburden/interburden and ore in 1998 was 24 million tons. Emissions associated with the permitted production of 60 million tons were calculated by scaling the emissions estimate for 1998 by a ratio of 2.5 (= 60 million tons divided by 24 million tons).

The assumptions in Table 3.8-14 are used to estimate the amount of equipment that would potentially be used to achieve the permitted production rate. Table 3.8-15 shows the estimated fuel consumption, hours of use, and other parameters for each equipment type that would be needed at the permitted production rate. Table 3.8-16 shows the estimated emission rates from the exhaust of the mobile equipment engines and the stationary sources, based on the parameters shown in Table 3.8-15. Noncriteria pollutant emissions that are used in the health risk assessment are discussed in Section 4.1.8.5 of this EIR/EIS.

As will be seen in the air quality impact analysis in Section 4.1.8, the daily and annual emission rates currently permitted to achieve an annual production rate of 60-million tons of overburden/interburden and ore are the same for the mine expansion. The only difference is the distribution of the emission locations over the area of the mine.

Mining activities produce fugitive dust as well as exhaust emissions. The various sources and amounts of PM_{10} in fugitive dust are shown in Table 3.8-17. The travel of haul trucks on unpaved roads is the largest source of fugitive PM_{10}, accounting for 92 percent of total fugitive dust emissions. During the maximum scenario day, production could be 50 percent more than the average needed to achieve the permitted 60-million tons. The haul trucks could travel 6,983 miles over an unpaved road distance of approximately 1.4 miles to place overburden/interburden in a storage area and 2.8 miles to place ore on Leach Pad No. 6 Extension.

Travel of haul trucks and the onsite fleet of service/maintenance/administrative trucks on unpaved roads accounts for 98 percent of fugitive PM_{10} emissions. The current efficiency of controlling PM_{10} emissions from unpaved roads is estimated to be 53 percent, based on the use of the existing watering protocol (Cowherd et al., 1988). This protocol is based on watering intensity of 0.18 gallons per square yard at a frequency of every 45 minutes.

Offsite mobile source emissions are produced by the exhaust from the vehicles used by commuting employees and by delivery vehicles bringing supplies to the mine. These emission are shown

in Table 3.8-18, amounting to only about 0.6 percent of the total emissions from the Proposed Action.

Because the mine has been operating since 1985, the impacts of existing emissions on ambient air quality have been accounted for in the monitored air quality concentrations discussed in Section 3.1.8.4.

3.8.6 Summary of Existing Air Quality Environment

The site of the Proposed Action has good air quality, both in terms of concentrations of criteria pollutants and the ability of the atmosphere to disperse local sources of air emissions. The Mesquite Mine has been operating since 1985 with an initial annual production permitted to reach 40-million tons of overburden/interburden and ore. This limit was increased to 60-million tons in 1996. Mining rates will not increase above this permitted level as a result of the Proposed Action. Hence, the emissions associated with the Proposed Action do not increase. The proposed expansion of the mine moves the location of mining activities and its emissions, but does not increase the permitted amount.

Imperial County is classified as nonattainment for ozone and PM_{10} ambient air quality standards.

The ambient concentrations of the criteria pollutants measured at the urban monitoring stations during the period 1996-1998 result in the following pollutant-specific review requirements for the Proposed Action:

- NSR of Nonattainment Pollutant Emissions:
  - NO_x (for ozone and PM_{10})
  - ROC (for ozone and PM_{10})
  - PM_{10}
  - SO_x (for PM_{10})
- PSD Review of Attainment Pollutant Emissions:
  - NO_x (for NO_2)
  - SO_x (for SO_2)
  - CO

Two criteria pollutant emissions, NO_x and SO_x, are reviewed for compliance with both NSR and PSD regulatory programs.

Table 3.8-14

Assumptions To Calculate The Permitted Emission Inventory Mesquite Mine

- Permitted annual production rate = 60 million total tons overburden/interburden and ore per year.
- Annual work schedule to achieve permitted annual production rate = 356 days per year (=365 minus 9 holidays per year).
- Average daily production rate to achieve permitted annual production rate = 168,539 total tons overburden/interburden and ore per day.
- Ratio of potential maximum to average daily production rates = 1.5
- Potential maximum daily production rate, consistent with permitted annual production rate = 252,809 tons overburden/interburden and ore per day.
- Onsite vehicle speed limit = 35 miles per hour.
- The boiler and carbon kiln are heated with liquid petroleum gas (LPG) having a density of 4.20 pounds per gallon.
- The PM_{10} emission factor for the induction (electric) furnace is 0.019 pounds per hour, based on source tests on similar furnaces at the Twin Creeks Mine in Nevada.

Table 3.8-15

Equipment Type Usage for Permitted Production Rate
Mesquite Mine

Equipment Type	Equipment Type Monthly Fuel Consumption [1] (gallons/month)	Equipment Type Monthly Usage [1] (hrs/month)	Equipment Type Daily Usage [2] (hrs./day)	Onsite Round Trip Distance Traveled by Equipment Type		Notes
				Maximum (mi/yr.)	Maximum (mi/day) [3]	
Loaders	16,117	740	25.0	--	--	
Haul Trucks	363,831	12,248	412.9	1,657,197	6,983	
Track Dozers	28,348	2,337	78.8	--	--	
Rubber-Tire Dozers	13,837	1,228	41.4	--	--	
Drills	29,243	903	30.4	--	--	
Cranes	--	2.5	0.084	--	--	
Motor Graders	7,789	1,123	37.8	--	--	
Shovel	109,646	1,842	62.1	--	--	
Fork Lift	--	200	6.7	--	--	
Water Truck (diesel)	18,754	1,420		198,000	834	4.7
Service Truck (diesel)	--	--	--	125,000	351	4
Light Plant	--	1,250	42.1	--	--	
Compressor	--	10	0.3	--	--	
Welder	--	13	0.4	--	--	
Pump	--	38	1.3	--	--	
Small-Med. Truck (gas)	--	--	--	485,213	1,363	4
Medium Truck (diesel)	--	--	--	125,000	351	4
Generator (diesel)	--	2,700	107	--	--	5
Generator, portable (gas)	--	50.7	2	--	--	6

- - = Not applicable

1) Average monthly usage to achieve permitted annual production rate of 60 million tons is calculated by multiplying current usage by the ratio of permitted an current production rates.

Max. mine expansion production (million tons of overburden/interburden and ore per year)= 60

Current mine production (million tons of overburden/interburden and ore per year)= 24 Ratio = 2.5

2) Total average daily usage equals average monthly usage divided by working days per month. Max. daily usage equals these values times 1.5

Average number of working days per month = 29.67

3) Working days per year to achieve permitted production rate = 356 (=365-9 Holidays)

4) Water, service, and medium diesel-fueled trucks, and small-medium gasoline-fueled trucks travel distances proportional to total production.

5) Four diesel-fueled generators pump water out of Big Chief and Vista Pits, requiring a maximum of approximately 3,500 hours per month. Other diesel-fueled generators are only run up to 1 hour per month for testing.

6) Two portable gas-fueled generators are assumed to operate 1 hour every mining day.

7) Maximum scenario day is based on average day to achieve permitted production times the following factors: 1.5.

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Table 3.8-16
Onsite Stationary And Mobile Source Criteria Pollutant Emissions
Mesquite Mine At Permitted Production Rate

Source	Engine HP Rating	Load Factor (1)	Daily Usage For Equipment Type (2a,2b)	Annual Usage For Equipment Type (2a)	Onsite Round-Trip Distance Traveled By Equipment Type		NOx			ROC			PM_{10}			SOx			CO			Notes
							Emission Factor (3)	Emissions		Emission Factor (3)	Emissions		Emission Factor (3)	Emissions		Emission Factor (3)	Emissions		Emission Factor (3)	Emissions		
					(mi/ day)	(mi/ yr)		(lbs/ day)	(tons/ yr)		(lbs/ day)	(tons/ yr)		(lbs/ day)	(tons/ yr)		(lbs/ day)	(tons/ yr)		(lbs/ day)	(tons/ yr.)	
Mobile Sources																						
Loader	--	--	106 gal/day	25,200 gal/yr	--	--	203 g/gal	47	6	4.6 g/gal	1	0.1	0.6 g/gal	0	0.0	3.2 g/gal	1	0.1	3.1 g/gal	1	0.1	
Haul Trucks	--	--	18,396 gal/day	4,365,973 gal/yr	--	--	168 g/gal	6800	807	2.4 g/gal	96	11.4	3.1 g/gal	126	14.9	3.2 g/gal	132	15.6	33 g/gal	1350	160.2	(4)
Track Dozer	--	--	1433.3 gal/day	28,041 gal/yr	--	--	122 g/gal	386	3.8	12.1 g/gal	38	0.4	2.7 g/gal	8	0.1	3.3 g/gal	10	0.1	15 g/gal	47	0.5	(5)
Rubber-Tire Dozer	--	--	699.6 gal/day	14,734 gal/yr	--	--	112 g/gal	173	1.8	0.5 g/gal	1	0.0	2.4 g/gal	4	0.0	3.3 g/gal	5	0.1	19 g/gal	29	0.3	(6)
Drill	--	--	0.0 gal/day	10,830 gal/yr	--	--	149 g/gal	0	1.8	3 g/gal	0	0.0	7 g/gal	0	0.1	3 g/gal	0	0.0	32 g/gal	0	0.4	(7)
Crane	240	0.43	1.5 hours/day	30 hours/year	--	--	0.023 lb/hp-hr	3.6	0.04	0.003 lb/hp-hr	0.5	0.00	0.002 lb/hp-hr	0.2	0.00	0.002 lb/hp-hr	0.3	0.00	0.009 lb/hp-hr	1.4	0.01	(8)
Motor Grader	--	--	393.8 gal/day	13,474 gal/yr	--	--	133 g/gal	115	2.0	34 g/hr	30	0.5	30 g/hr	26	0.4	46 g/hr	40	0.7	94 g/hr	82	1.4	(9)
Shovel	2400	0.50	93.1 hours/day	22,101 hours/year	--	--	10.7 g/hp-hr	2654	314.9	0.12 g/hp-hr	30	3.5	0.5 g/hp-hr	124	14.7	0.14 g/hp-hr	36	4.2	0.9 g/hp-hr	223	26.5	(10)
Fork Lift	80	0.30	10.1 hours/day	2,400 hours/year	--	--	1.7 lb/hr	5.16	0.61	0.15 lb/hr	0.46	0.05	0.14 lb/hr	0.42	0.05	0.14 lb/hr	0.43	0.05	0.68 lb/hr	2.05	0.24	(11)
Water Truck (diesel)	--	--	--	--	834	198,000	19.3 g/mi	35.5	4.21	1.3 g/mi	2.4	0.29	0.75 g/mi	1.4	0.16	0.3 g/mi	0.6	0.07	7.3 g/mi	13.4	1.59	(12)
Service Truck (diesel)	--	--	--	--	351	125,000	6.8 g/mi	5.3	0.94	1.0 g/mi	0.8	0.14	0.50 g/mi	0.4	0.07	0.310 g/mi	0.2	0.04	6.0 g/mi	4.7	0.83	(13)

Source: TRC, 2000

Table 3.8-16 (continued)

Onsite Stationary And Mobile Source Criteria Pollutant Emissions
Mesquite Mine At Permitted Production Rate

Source	Engine Hp Rating	Load Factor (1)	Daily Usage For Equipment Type (2a,2b)	Annual Usage For Equipment Type (2a)	Onsite Round-Trip Distance Traveled By Equipment Type		NOx			ROC			PM_{10}			SOx			CO			Notes
							Emission Factor (3)	Emissions		Emission Factor (3)	Emissions		Emission Factor (3)	Emissions		Emission Factor (3)	Emissions		Emission Factor (3)	Emissions		
					(mi/ day)	(mi/ yr)		(lbs/ day)	(tons/ yr)		(lbs/ day)	(tons/ yr)		(lbs/ day)	(tons/ yr)		(lbs/ day)	(tons/ yr)		(lbs/ day)	(tons/ yr.)	
Light Plant	40	0.74	42.1 hours/day	15,000 hours/year	--	--	0.018 lb/hp-hr	22.4	4.00	0.002 lb/hp-hr	2.5	0.44	0.001 lb/hp-hr	1.2	0.22	0.002 lb/hp-hr	2.5	0.44	0.011 lb/hp-hr	13.7	2.44	(14)
Compressor	90	0.48	0.5 hours/day	120 hours/year	--	--	1.7 lb/hr	0.41	0.05	0.15 lb/hr	0.04	0.004	0.14 lb/hr	0.03	0.004	0.14 lb/hr	0.03	0.004	0.68 lb/hr	0.16	0.02	(11)
Welder	90	0.45	0.6 hours/day	150 hours/year	--	--	1.7 lb/hr	0.48	0.06	0.15 lb/hr	0.04	0.01	0.14 lb/hr	0.04	0.005	0.14 lb/hr	0.04	0.005	0.68 lb/hr	0.19	0.02	(11)
Pump, Water	180	0.74	1.3 hours/day	454 hours/year	--	--	1.7 lb/hr	1.60	0.29	0.15 lb/hr	0.14	0.03	0.14 lb/hr	0.13	0.02	0.14 lb/hr	0.13	0.02	0.68 lb/hr	0.64	0.11	(11)
Small-Med. Truck (gasoline)		--	--	--	1,363	485,213	3.19 g/mi	9.6	1.71	0.30 g/mi	0.9	0.16	0.050 g/mi	0.2	0.03	0.31 g/mi	0.9	0.17	5.84 g/mi	17,5	3.12	(15)
Medium Truck (diesel)		--	--	--	351	125,000	6.82 g/mi	5.3	0.94	1.02 g/mi	0.8	0.14	0.50 g/mi	0.4	0.07	0.31 g/mi	0.2	0.04	6.0 g/mi	4.7	0.83	(13)
Generator (diesel)	60	0.74	106.6 hours/day	32,400 hours/year	--		1.7 lb/hr	181	9.7	0.15 lb/hr	16	0.9	0.14 lb/hr	15	0.8	0.14 lb/hr	15	0.8	0.68 lb/hr	72	3.8	(11)
Generator (gasoline)	10	0.74	2.0 hours/day	608 hours/year	--		0.41 lb/hr	0.6	0.00	0.54 lb/hr	0.8	0.00	0.026 lb/hr	0.04	0.80	0.02 lb/hr	0.03	0.00	17.0 lb/hr	25	0.02	(16)
Stationary Sources																						
Smelting Furnace (electric)	--	--	24 hours/day	8760 hours/year	--	--	--	--	--	--	--	--	0.019 lb/hr	0.5	0.08	--	--	--	--	--	--	
Carbon Kiln (LPG), Burner Section	--	--	--	1.1 kgal/year	--	--	20 lb/kgal	0.06	0.011	0.55 lb/kgal	0.0017	0.0003	0.60 lb/kgal	0.0018	0.0003	0.017 lb/kgal	0.0001	0.00001	3.40 lb/kgal	0.01	0.002	(17,18)

Source: TRC, 2000

Table 3.8-16 (continued)

Onsite Stationary And Mobile Source Criteria Pollutant Emissions
Mesquite Mine At Permitted Production Rate

Source	Engine Hp Rating	Load Factor (1)	Daily Usage For Equipment Type (2a,2b)	Annual Usage For Equipment Type (2a)	Onsite Round-Trip Distance Traveled By Equipment Type		NOx			ROC			PM_{10}			SOx			CO			Notes
							Emission Factor (3)	Emissions		Emission Factor (3)	Emissions		Emission Factor (3)	Emissions		Emission Factor (3)	Emissions		Emission Factor (3)	Emissions		
					(mi/ day)	(mi/ yr)		(lbs/ day)	(tons/ yr)		(lbs/ day)	(tons/ yr)		(lbs/ day)	(tons/ yr)		(lbs/ day)	(tons/ yr)		(lbs/ day)	(tons/ yr.)	
Carbon Kiln / Drum Section	--	--	--		--	--	--	--	--	--	--	--	--	25.3	4.62	--	--	--	--	--	--	
Boiler (LPG)	--	--	--	45 kgal/year	--	--	20 lb/kgal	2.4	0.4	0.55 lb/kgal	0.07	0.012	0.60 lb/kgal	0.07	0.013	0.017 lb/kgal	0.0021	0.0004	3.40 lb/kgal	0.41	0.08	(17,19)
Electro-winning Cell	--	--	24 hours/day	8760 hours/year	--	--	--	--	--	--	--	--	0.17 lb/hr	4.1	0.74	--	--	--	--	--	--	
Gasoline Storage Tank	--	--	--	--	--	--	--	--	--	--	13.9	2.54	--	--	--	--	--	--	--	--	--	
Diesel Storage Tank #1	--	--	--	--	--	--	--	--	--	--	7.7E-04	1.4E-04	--	--	--	--	--	--	--	--	--	
Diesel Storage Tank #2	--	--	--	--	--	--	--	--	--	--	3.9E-03	7.2E-04	--	--	--	--	--	--	--	--	--	
Diesel Storage Tank #3	--	--	--	--	--	--	--	--	--	--	0.35	0.06	--	--	--	--	--	--	--	--	--	
Diesel Storage Tank #4	--	--	--	--	--	--	--	--	--	--	5.2E-04	9.5E-05	--	--	--	--	--	--	--	--	--	
Diesel Storage Tank #5	--	--	--	--	--	--	--	--	--	--	1.1E-03	2.0E-04	--	--	--	--	--	--	--	--	--	
Diesel Storage Tank #6	--	--	--	--	--	--	--	--	--	--	1.1E-03	2.0E-04	--	--	--	--	--	--	--	--	--	

Source: TRC, 2000

Table 3.8-16 (continued)

Onsite Stationary And Mobile Source Criteria Pollutant Emissions
Mesquite Mine At Permitted Production Rate

Notes:
-- = Not applicable.
1) For equipment without emission factors based on fuel (e.g., grams of NOx emitted per gallon of diesel fuel), a load factor is taken from the literature to give the average power at which the equipment type is operated.
2A) Calculated from mean monthly fuel usage for all units of one equipment type.
2B) Maximum scenario day is based on average day to achieve permitted production times the following factor:
1.5
3) Emission factors are from Caterpillar Corporation, USEPA, California Air Resources Board, and South Coast Air Quality Management District, as shown in Appendix A.
4) Haul truck emission factors are for Caterpillar 793C (see Appendix A).
5) Emission factors are for D9N (see Appendix A).
6) Same engine as 988F wheeled loader with about the same work cycle.
7) Used Caterpillar Corporation emission data for 3412 engine
8) Emission factors from SCAQMD CEQA Handbook Table A9--8-B, November 1993 (see Appendix A).
9) Emission factors for 16G or H motorgrader from Caterpillar Corp. as shown in Appendix A.
10) Assumes two 1200hp Cummins KTA38C engines. Emission factors are in Appendix A.
11) Used miscellaneous diesel equipment from SCAQMD CEQA Handbook Table A9--8-A (see Appendix A).
12) Used emission factors for heavy-heavy diesel trucks from MVEI7G Emission Factors (1999, 35mph, 75F)
13) Used emission factors for medium-heavy diesel trucks from MVEI7G Emission Factors (1999, 35mph, 75F)
14) Used emission factors for generator sets less than 50 hp from SCAQMD CEQA Handbook TableA9--8-B (see Appendix A).
15) Used gasoline-fueled vehicle emission factors from MVEI7G (1999, 35 mph, 75F).
16) Used miscellaneous gasoline-fueled equipment from SCAQMD CEQA Handbook Table A9-8-A (see Appendix A).
17) Emission factors, in pounds per 1000 gallons LPG, for gasoline-fueled generators are taken from U.S. EPA, Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Chapter 1.5: Liquefied Petroleum Gas Combustion, Tab
18) Carbon kiln proportion of LPG use is calculated from early (Count of Imperial and Bureau of Land Management, 1984) estimate of 34,640 gallons for kiln burner and 1,405,500 gallons for boiler.
19) LPG use in 1998 was 187,000 pounds (Newmont, 1999). LPG density = 4.20 lbs/gal according to Petrolane (1991).

Table 3.8-17
Onsite Fugitive PM 10 Emissions (1)
Mesquite Mine at Permitted Production Rate

Source Category	Source Description	Amount	Utilization Factor	No. units	Round-Trip Distance per Unit (miles)	Parameter 1	Hours Per Day	Uncontrolled		Control		Controlled Emission Rate		Notes	
								Emission Factor	Emission Rate (lb/day)	Technique	Efficiency(%)	(lb/day)	(g/sec)		
Paved Road: Property line to administration area (Distance = 200 yards).															
Employee Vehicles		--	--	82	0.23	19 vmt/day	24	0.330 lb/vmt	6	None	0%	6.15	0.0323	2	
Delivery Vehicles		--	--	10	0.23	2 vmt/day	24	0.368 lb/vmt	1	None	0%	0.84	0.0044	2	
SUBTOTAL - PAVED ROAD EMISSIONS									7			7.0	0.037		
Unpaved Road: Mine Pit to Over burden to Leach Pad Connector Roads.															
Haul Truck		--	--	--	--	6983 vmt/day	24	2.12 lb/vmt	14,786	Existing Watering	53%	6,949	36.5	3,4	
Motor Grader		--	--	2	4.3	13 vmt/day	24	0.05 lb/vmt	0.67	Existing Watering	53%	0.3	0.002	3,5	
Service Truck (diesel)		--	--	11	6.1	100 vmt/day	24	2.12 lb/vmt	212	Existing Watering	53%	99.5	0.523	3,6	
Small-Med. Truck (gasoline)		--	--	43	6.1	391 vmt/day	24	1.41 lb/vmt	552	Existing Watering	53%	259.4	1.363	3,6	
Medium Truck (diesel)		--	--	9	6.1	82 vmt/day	24	2.12 lb/vmt	173	Existing Watering	53%	81.4	0.428	3,6	
SUBTOTAL - UNPAVED ROAD EMISSIONS									15,723			7,390	39		
Miscellaneous															
Lime loading/unloading	114 tons per day	--		1	--	--	24	0.05 lb/ton	5.7	Baghouse and enclosure	90%	0.57	9.9	1.29E-05	7
ANFO loading/unloading	28 tons per day	--		1	--	--	24	0.02 lb/ton	0.6	Enclosure	99%	0.006	0.098	1.28E-07	8
Drilling	50 holes/pit/ day	--		2 pits	--	25,000 holes/pit/yr	24	0.07 lb/hole	7	Wet drilling	0%	7	0.6	8.04E-07	9,14
Blasting	1 blasts/pit/ day	--		2 pits	--	150 blasts/pit/yr	24	10.95 lb/blast	22	--	0%	22	1.9	2.48E-06	10
SUBTOTAL - MISCELLANEOUS EMISSIONS									35			29.6	12.5	1.63E-05	

Source: TRC, 2000

Table 3.8-17 (continued)

Onsite Fugitive PM 10 Emissions (1)
Mesquite Mine at Permitted Production Rate

Source Category	Source Description	Amount	Utilization Factor	No. units	Round-Trip Distance per Unit	Parameter 1	Hours Per Day	Uncontrolled		Control		Controlled Emission Rate (lb/day)	Controlled Emission Rate		Note:
								Emission Factor	Emission Rate (lb/day)	Technique	Efficiency(%)		(lb/day-	(g/sec-m^2)	
Disturbed Areas: Drilling, Overburden Loading and Placement, Ore Loading and Placement, and Drainage Construction															
Shoveling overburden and loading ore		252,809 tons/day	--	2	--	--	24	1.89E-04 lb/ton	48	Existing Watering	53%	22.4	0.4	5.49E-07	3
Track Dozing		19.44 hours/day	--	5	--	97.2 device-hrs		0.87 lb/device-hour	85	Existing Watering	53%	39.7	2.15	3.44E-06	3,11,12
Rubber-Tire Dozing		19.44 hours/day	--	2	--	38.9 device-hrs		0.87 lb/device-hour	34	Existing Watering	53%	15.9	0.6	9.6E-07	3,11,13
SUBTOTAL - DISTURBED AREA EMISSIONS									166			78	3	0	
Wind Erosion: Drilling, Overburden Loading and Placement, Ore Loading and Placement, and Drainage Construction Areas															
Wind Erosion		24 hours/day	--	52.9 acres	--	--	24	3.2 lb/acre-day	167	Existing Watering	53%	79	1.5	1.93E-06	3
SUBTOTAL - WIND EROSION EMISSIONS									167			79	1.5	1.93E-06	
TOTAL FUGITIVE PM10 EMISSIONS									16,064			7,554	44	6.88E-06	

Source: TRC, 2000

-- = Not applicable.

1) Road fugitive dust is simulated in the ISC3 model as a series of volume sources with emission rates in grams per second (g/sec), while construction disturbance and wind erosion fugitive dust is simulated as area sources with emission rates in g/sec per square meter.
2) Emission factor taken from SCAQMD, CEQA Air Quality Handbook, November 1993.
3) Watering control efficiency of 53% based on Cowherd et al (1988), and a watering intensity of 0.804 liter water per square meter (=0.18 ga/sq. yd) every 45 minutes.
4) Maximum scenario day is based on average day to achieve permitted production times the following factor: 1.5
5) Motor grader is conservatively assumed to make a daily pass over the roads between the mining area and the placement areas for overburden/interburden and ore. Speed assumed to be 6 mph.
6) Each service, small-medium, and medium truck is conservatively assumed to make one daily 16,000-foot (one-way) trip between the maintenance area and the East Rainbow North Overburden/Interburden Storage Area.
7) Emission factor is for controlled emissions (USEPA, Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, PB86-124906 Part 2 of 2, Chapter 8.10: Concrete Batching, Table 8.10-1, February 1972). Activity area assumedc to be 50-foot square.
8) Emission factor is for uncontrolled emissions (USEPA, Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Chapter 8.3: Ammonium Nitrate, Table 8.3-2, July 1993). Activity area assumed to be 50-foot square.
9) Emission factor is for controlled wet drilling (see Table A.1-10). Activity area assumed to be 500-foot square in each of Rainbow and Big Chief Pits.
10) Emission factor is for uncontrolled blasting (see Table A.1-10). Activity area assumed to be 500-foot square in each of Rainbow and Big Chief Pits.
11) Availability of 90% and utilization of 90%result in 19.44 hours of usable time. Area= 500-foot square.
12) Track dozers used at three 500-foot square areas (two overburden storage areas and one leach pad) and 80 ft. by 700 ft. drainage construction area.
13) Two 834B rubber-tired dozers used predominantly. Two 824C rubber-tired dozers hardly used at all.
14) Fugitive dust created by drilling assumed similar to that from fillin ga storage pile or dumping from a truck. See Attachment 1 and SCAQMD, CEQA Air Quality Handbook, Table A9-9-G, November 1993.

Table 3.8-18

Offsite Criteria Pollutant Emission Inventory
Current Mesquite Mine

Source	Total Daily Usage (1)	Total Annual Usage (2)	Maximum Number of Units (3)	Off-site Round Trip Distance		NOx			ROC			PM_{10}			SOx			CO			Notes
						Emission Factor	Emissions		Emission Factor	Emissions		Emission Factor	Emissions		Emission Factor	Emissions		Emission Factor	Emissions		
				(mi/day-unit)	(mi/yr-unit)		(lbs/day)	(tons/yr)		(lbs/day)	(tons/yr)		(lbs/day)	(tons/yr)		(lbs/day)	(tons/yr)		(lbs/day)	(tons/yr)	
Activity																					
Commuting																					
Light-heavy duty Trucks (gasoline)	1	304	82	90	27,360	2.86 g/mi.	47	7.1	0.16 g/mi.	2.6	0.40	0.050 g/mi.	0.8	0.12	0.31 g/mi.	5.0	0.77	3.67 g/mi.	59.7	9.1	4
Delivery																					
Medium Truck (diesel)	1	304	10	90	27,360	19.31 g/mi.	38	5.8	0.94 g/mi.	1.9	0.28	0.75 g/mi.	1.5	0.23	0.31 g/mi.	0.6	0.09	8.0 g/mi.	15.8	2.4	5
TOTAL							85	12.9		4.5	0.68		2.3	0.35		5.7	0.86		75.5	11.5	

1) Assumes each vehicle makes one daily round trip to the mine from surrounding communities.
2) 304 working days per year is based on 6 days per week for 52 weeks per year minus 8 holidays.
3) Conservatively assumes 164 workers carpooling at 2 persons per vehicle.
4) Emission factors for gasoline-powered light-heavy duty trucks with catalytic converters (MVEI7G for 1999, 65mph, 75°F. Distance based on average of 45 miles one-way to surrounding communities.

3.9 LAND USE

3.9.1 Scope and Regulatory Status

Impacts to land uses are determined by reviewing the land use plans and policies pertaining to the proposed site. The applicable plans and policies are:

1. The Imperial County General Plan;
2. Imperial County Zoning Ordinance;
3. Title 9 Imperial County Land Use Ordinance;
4. BLM California Desert Conservation Area (CDCA) Plan;
5. California Desert Protection Act (PL 103-433) October 31, 1994;
6. Northern and Eastern Colorado Desert Coordinated Management Plan (NECDMP); and,
7. Division 6 of the California Public Resources Code.

The Imperial County General Plan provides land use designations and policy guidelines for development in the unincorporated areas within Imperial County. The Proposed Action is located within the unincorporated area of Imperial County on Federal, State, and privately-owned land. Privately-owned land falls under the jurisdiction of the Imperial County General Plan and Zoning Ordinance.

Zoning and other land use regulations in Imperial County are designed to ensure land use compatibility through a hierarchical system of zoning. These regulations allow the prohibition within a designated zone of a particular class of building, structure, premise, or use (Title 9 Imperial County Land Use Ordinance, 1998).

As directed by the Federal Land Policy and Management Act of 1976 (FLPMA), the CDCA Plan was set up to manage a 25-million-acre area located in the deserts of southwestern California, including 12 million acres of public lands, which are administered by the BLM. The project area is located within the CDCA; therefore, BLM-managed land within the project area falls under the jurisdiction of this plan. The existing mine has BLM/County approvals, and the proposed expansion is within previously approved mining areas, except for two half sections of State lands to the north of Big Chief Pit. These lands were deleted from the Chocolate Mountain Gunnery Range Chocolate Mountain Parcels by the California Desert Protection Act (CDPA) of 1994. A land exchange involved a transfer of the two half sections to the California State Lands Commission (SLC) in exchange for equal value SLC inholdings (SLC lands that are situated within areas designated by the CDPA as wilderness and units of the National Park Service) within the confines of the CDPA Boundaries. The land exchange was approved in part to satisfy the 1994 CDPA provision that permits the SLC to exchange lands with the BLM for loss of the SLC inholdings. The SLC was interested in receiving the two half sections as partial compensation because of the potential value of

future mineral revenues to the State Teachers Retirement System. If the lands contain valuable minerals, the SLC would receive royalties under a mineral extraction lease, and the United States would receive title to SLC inholdings of comparable value. Under Division 6 of the California Public Resources Code, the SLC is directed to manage school lands incorporating a multiple use concept for land use planning. These uses have included recreation; research; farming; grazing; timber harvesting; oil, gas and geothermal development; mineral exploration; and mining while protecting the associated environmental resources. The SLC is currently processing a mineral extraction lease application involving approximately 658 acres of land, of which 97 acres would be disturbed by the proposed Mesquite Mine expansion. Anticipated impacts to the environmental resources located on or adjacent to the 97 acres are addressed in this EIR/EIS. Environmental issues associated with any subsequent mining development on the balance of those lands is addressed in Section 4.4.4 of this EIR, to the extent possible. No intent or plan for such development is known at this time.

The BLM is currently drafting a long-term regional management plan, which is outside the scope of this mine expansion project. The plan, entitled "Northern and Eastern Colorado Desert Coordinated Management Plan" (NECDMP), would address a broad spectrum of land uses which include mineral exploration and development as well as protection of biological resources. Plan decisions would involve only state and federal lands, and would provide the basis for the BLM to amend its 1980 California Desert Conservation Area Plan (CDCA) and for the cooperating agencies to update their land and resource management plans. An overview and progress report on the plan was published in July 1995 and addresses those comments received during the public scoping period. The scoping process has been completed and a draft plan is anticipated for release in spring 2000.

The mining operation was previously evaluated for potential land use impacts, and has operated under an approved Plan of Operations (POO) since 1985. The existing mining operation is consistent with the CDCA Plan and the Imperial County General Plan, and operates under permits in compliance with the Surface Mining and Reclamation Act (SMARA) and other applicable regulations.

3.9.2 Existing and Surrounding Land Uses

3.9.2.1 Existing Land Use and Ownership (Site)

The Mesquite Mine and associated processing facilities are located on public lands administered by the U.S. Bureau of Land Management (BLM), El Centro Resource Area Office of the California Desert District, and on private land owned by Hospah Coal Company and leased to Santa Fe Pacific Gold Corporation (SFPGC), and operated by Newmont Gold Company. Land ownership status within the proposed POO boundary is shown in Figure 1.3-4. The Mesquite Mine is located within portions of Sections 31, 32 and 33, Township 13 South, Range 21 East, and Sections 4,5,6,7, and 8, Township 14 South, Range 21 East, San Bernardino Baseline & Meridian (SBB&M). The facility currently encompasses approximately 5,200 acres, of which approximately 3,800 acres have been disturbed under existing permits and approvals. Existing and permitted facilities are described in Chapter 1 section 1.3.2.2 of this EIR, which includes existing and allowable disturbance acreage (Table 1.3-1).

3.9.2.2 Surrounding Land Uses

Current land uses in the area consist of mineral exploration and development, aerial military training overflights, utility corridors, and dispersed recreational activities by the general public. Similar public lands with similar uses generally surround the project area. A self-guided overlook trail, approximately 0.8 miles in length, is located along the mine access road. This trail provides a view of the mine's operations as well as other information about the desert. This trail, designed to educate visitors, was built voluntarily as a joint effort by Gold Fields, the former owner of the Mine, and the BLM. The nearest permanent residences to the Mesquite Mine are located at the Boardman and Glamis Beach Store areas, located three to 3.5 miles, respectively, southwest of the Mine.

Several operating mines are located or proposed in the vicinity of the Mesquite Mine. The American Girl/Oro Cruz Mine is located about 15 miles south of the site, while the Picacho Mine is located about 16 miles east of the site. The Imperial Project Mine is proposed about 10 miles southeast of the Mesquite Mine.

The U.S. Marine Corps (USMC) maintains the Chocolate Mountain Aerial Gunnery Range (CMAGR), which is located immediately north of the Mesquite Mine. The USMC uses CMAGR for military aircraft training and live ordinance delivery. The USMC conducts both daytime and nighttime helicopter flight training in and around the Project area, and two military visual flight rule (VFR), low-level flying routes for fixed wing aircraft are located in the vicinity of the Project area (Personal Communication, T.A. Manfredi, USMC, June 2, 1995). Mine operations are currently compatible with the CMAGR.

3.9.3 Adopted Land Use Plans and Policies

The use of land on the project area is controlled by a number of adopted plans and policies, which are discussed below in greater detail.

3.9.3.1 Imperial County General Plan

The Imperial County General Plan was developed to create a balanced, comprehensive guide for future physical development of lands within the County, and provides mechanisms to achieve the County's desired goals and objectives. The General Plan strives towards achieving a balance between development and economic, social, and environmental resources. The General Plan includes the following mandatory Elements: Land Use, Circulation/Scenic Highways, Housing, Conservation/Open Space, Seismic and Public Safety, and Noise. In addition, the County has included three additional Elements: Agriculture, Water, and Geothermal.

The Land Use Element of the Imperial County General Plan indicates that the mine is located within a large expanse of land currently dedicated to Special Purpose Facility, Recreation/Open Space, and Government/Special Public uses. The Special Purpose Facility designation allows mining and processing of mineral, aggregate, or other natural resources following approval of a conditional use permit.

Five elements in the General Plan are relevant to the Proposed Action: Land Use Element, Seismic and Public Safety Element, Conservation and Open Space Element, Water Element, and Noise Element. These elements include specific goals and objectives that must be considered for the Proposed Action. The purpose and specific objectives of each element of the County of Imperial Draft General Plan along with an analysis of the consistency/inconsistency with each relevant General Plan Objective is provided in Section 4.1.9 of this EIR/EIS.

Land Use Element

The Land Use Element guides the decision makers, staff, and the public in the distribution, general location, and extent of uses of land for housing, business, industry, open space, agriculture, and public facilities. The Land Use Element of the General Plan serves as the primary policy statement by the Board of Supervisors for implementing development policies and land uses in Imperial County, and presents Imperial County's goals, policies, principles, and implementation measures relative to all land use within the unincorporated areas of the County.

A key component of the Land Use Element is to delineate the boundaries and establish development standards for land use categories in order to maintain consistency and compatibility between uses and to classify the various land uses recognized by the General Plan. The Land Use Element contains nine land use designations and identifies allowable uses and provides development standards for each land use designation. Goals and objectives are included in the Land Use Element and the other General Plan elements. These goals are included as guidelines for land use decision-making. However, it should be noted that the General Plan also provides that "other social, economic, environmental, and legal considerations are involved in land use decisions and that these goals and objectives should be used as guidelines, but not doctrines."

Seismic and Public Safety Element

The Seismic and Public Safety Element identifies potential natural and human-induced hazards and provides policy to avoid or minimize the risk associated with hazards. Potential hazards must be addressed in the land use planning process to avoid the unfolding of dangerous situations. For example, the risk associated with dangerous flooding can be avoided by not allowing development in floodplains and imposing strict safety standards on water transmission facilities.

The purpose of the Seismic and Public Safety Element contained within the General Plan is directly concerned with reducing the loss of life, injury, and property damage that might result from a disaster or accident. This Element identifies goals and policies that would minimize the risks associated with natural and human-made hazards. In addition, the Element specifies land use planning procedures that should be implemented to avoid hazardous situations.

Conservation and Open Space Element

The County is charged with the responsibility of conserving environmental resources while encouraging economic development and growth. The Conservation and Open Space Element

identifies goals and policies to insure the managed use of environmental resources. The goals and policies are also designed to prevent limiting the range of resources available to future generations.

Water Element

The purpose of this element is to identify and analyze the types of water resources within Imperial County and to assure that goals and policies are adopted that preserve and enhance resource availability and quality. It has been prepared to assure that water resources are conserved and utilized to enhance long-term availability, while providing for current supplies and demands. In addition, this element has been prepared to improve the use and distribution of water in Imperial County, including the extension of current water conservation programs. Through this element, the County provides leadership, information and advisor services to help users increase efficiencies in their water consumption within the County.

Noise Element

The Noise Element contained within the General Plan provides a program for incorporating noise issues into the land use planning process with a goal of minimizing adverse noise impacts to receptors that are sensitive to noise. The Noise Element identifies existing and future noise sources, and defines noise-sensitive land uses. The element establishes goals, objectives, and procedures to protect the public from noise intrusion. The Noise Element also provides noise level criteria to be used to determine compatibility with all land use categories.

3.9.3.2 Imperial County Zoning and Land Use Regulations

Imperial County zoning and other land use regulations are designed to promote land use compatibility by designating acceptable uses and activities within identified areas or zones. Zoning regulations promote or prohibit uses, and designate appropriate building classes or structures within the various zones which are, in part, intended to prevent or inhibit conflicting or incompatible growth or uses within the respective zones (Imperial County, 1998).

The County has zoned the project site and surrounding area as S-2 (Open Space/Preservation), and G/S (Government/Special) with the exception of the area containing the approved but unbuilt 2,290-acre Mesquite Regional Landfill, which received an approved zone change in March 1997 from the S-2 (Open Space) to the "M-3" (Heavy Industrial) Zone. The S-2 Zone classification permits multiple use of the area, consistent with the objectives of the Open Space Element of the Imperial County General Plan (Imperial County, 1993). In the event that a parcel zoned G/S by virtue of the fact that it is under public ownership is sold or otherwise privatized, the zone of the parcel shall be automatically changed to that of S-2 (Title 9 Imperial County Land Use Ordinance, § 90520.12). Surface mining operations may be permitted in any zone upon the granting of a conditional use permit (ICZO § 83422). Subsequent approvals relevant to the Proposed Action are listed in Table 1.7-1.

3.9.3.3 BLM California Desert Conservation Area (CDCA) Plan

The Proposed Action site is located within the BLM CDCA, and is subject to the CDCA Plan. The CDCA encompasses 25 million acres of desert lands in eastern California, including 12 million acres of public lands. The CDCA was established by FLPMA. This law was passed by Congress in 1976 to direct the management of the public lands of the United States. The BLM was directed to inventory the CDCA resources and prepare a comprehensive land-use management plan. As the 12 million acres of public lands made up only half of the CDCA, this plan had to consider the effect that BLM-managed public lands would have on the other private lands included in the CDCA. Section 601 of FLPMA requires the BLM to develop a plan to "... provide for the immediate and future protection and administration of public lands in the California Desert within the framework of a program of multiple use and sustained yield, and the maintenance of environmental quality." Section 103 of FLPMA defines the terms "multiple use" and "sustained yield" as follows:

- The term "multiple use" means the management of public lands and their various resource values so that they are used in a combination that would best meet the present and future needs of the American people; making the most judicious use of the land for some or all of these resources or related services over areas large enough to provide sufficient latitude for periodic adjustments in the use to conform to changing needs and conditions; the use of some land for less than all of the resources; a combination of balanced and diverse resource values that takes into account the long-term needs of future generations for the renewable and non-renewable resources including but not limited to recreation, range, timber, minerals, watershed, wildlife and fish, and natural scenic, scientific, and historic values (BLM, 1980).

- The term "sustained yield" means the achievement and maintenance in perpetuity of a high-level annual or regular periodic output of the various renewable resources of the public lands consistent with multiple use (BLM, 1980).

The goal of the CDCA Plan is to provide and enhance uses for the public lands in the CDCA area including economic, educational, scientific and recreational uses, without diminishing the environmental, cultural and aesthetic values of these lands.

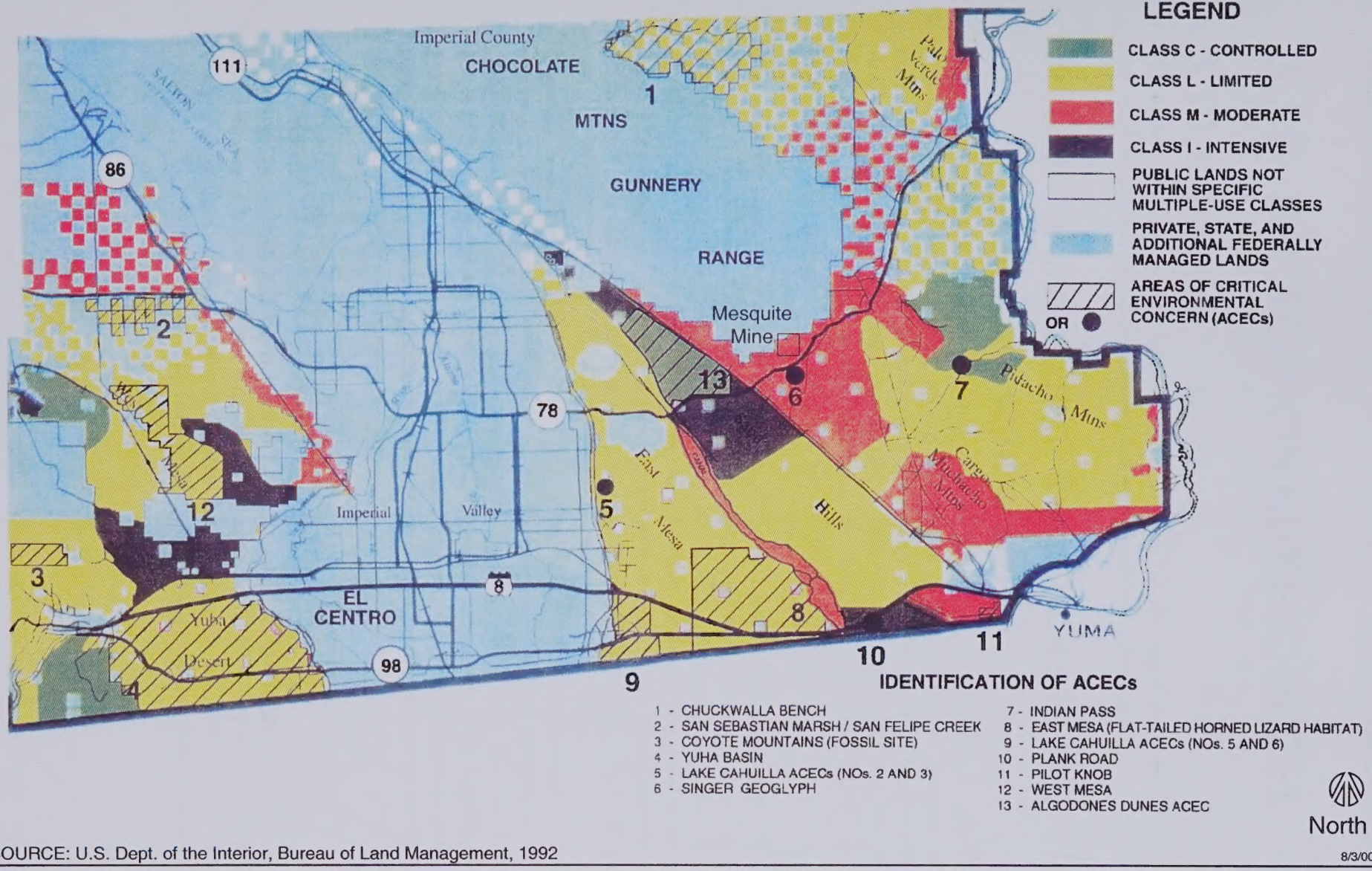
To aid in achieving this goal, all public lands in the CDCA under BLM management, except for a few small and scattered parcels, have been designated geographically into four multiple-use classes. Each class describes a different type, or degree of use permitted within that geographical area. The multiple-use classes include Class C (Controlled Use), Class L (Limited Use), Class M (Moderate Use), and Class I (Intensive Use). The CDCA Plan was adopted in 1980 and has been amended on an annual basis since. Figure 3.9-1 presents the CDCA Plan Map, including Plan amendments through the year 1990.

CDCA has designated the Mesquite Mine area as Multiple-Use Class M. This designation provides for balanced use between higher-intensity uses and protection of public lands. This designation allows mining, livestock grazing, energy and utility development, and recreational uses. Management of Class M lands is also designed to conserve desert resources and to mitigate damage to those resources that permitted uses may cause (BLM, 1980). Its purpose is to provide for concentrated use of lands and resources to meet human needs.

California Desert Protection Act

Applicable provisions of this Act have been described in Section 3.1.1 of this EIR.

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SOURCE: U.S. Dept. of the Interior, Bureau of Land Management, 1992

8/3/00

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BLM CDCA Plan Land Use Designations

FIGURE 3.9-1

3.10 RECREATIONAL RESOURCES

3.10.1 Scope

This section examines existing recreational resources in the vicinity of the proposed mine expansion that could be affected by the construction and operation of the expansion.

3.10.2 Recreational Resources in the Vicinity of the Mesquite Mine

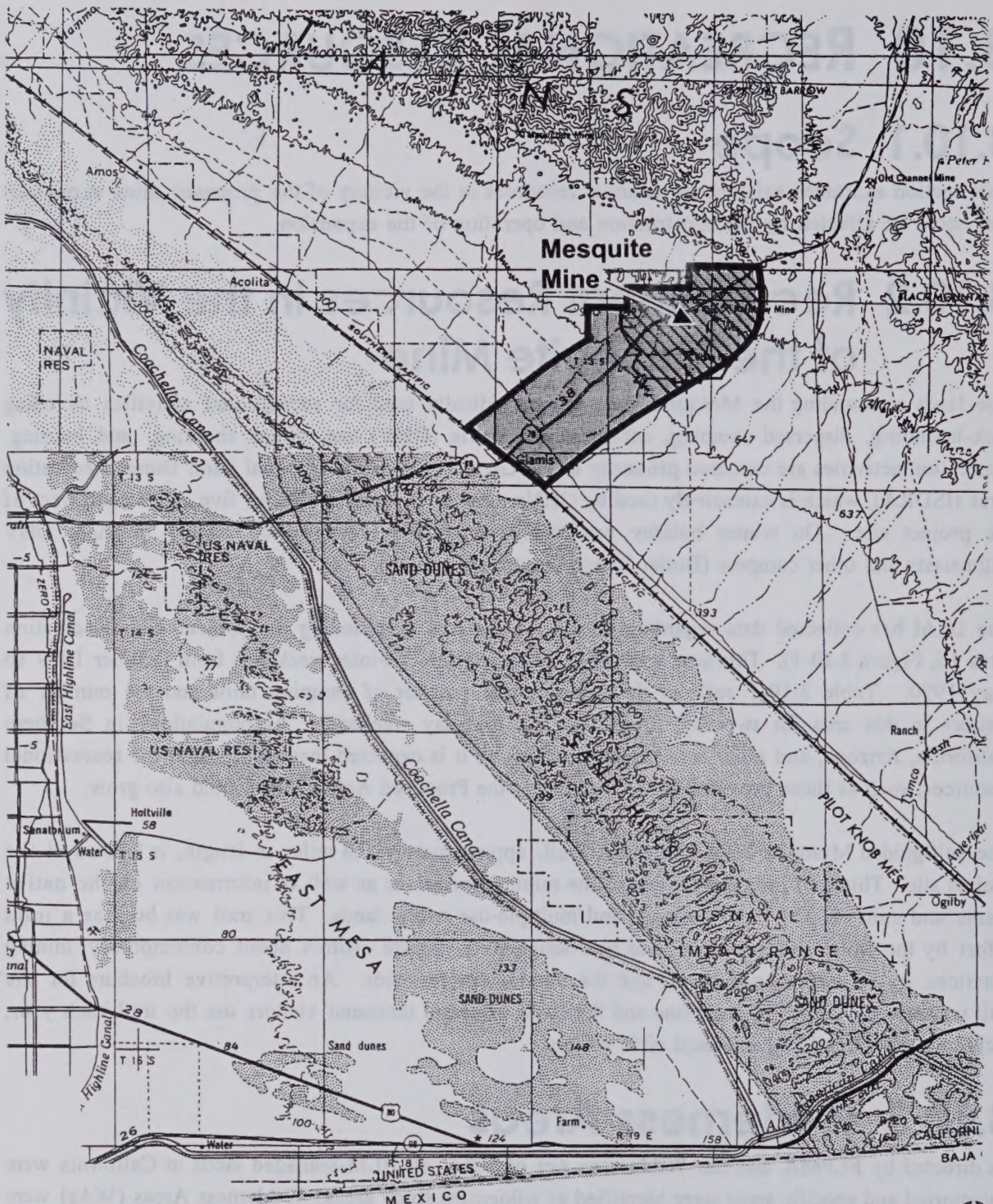
The lands surrounding the Mesquite Mine are periodically used for recreational activities including rock-hounding, dispersed camping, off-highway vehicle (OHV) use, target shooting, and hunting. Recreation activities are centered primarily in the Glamis area of the Imperial Sand Dunes Recreation Area (ISDRA), which is extensively used by OHVs. The sand dunes are about five miles southwest of the project site. On winter holiday weekends, the ISDRA is visited by 30,000 or more OHV enthusiasts and other campers (Butler Roach Group, Inc., 1995).

The BLM has collected data regarding the use of the area surrounding the project site (Recreation Area 16, Figure 3.10-1). This area was surveyed during select winter weekends from October 1989 to May 1990. Table 3.10-1 reflects the approximate number of camping units and the number of visitors in this area for two-day, three-day, and four-day weekends. As populations in Southern California, Arizona, and other areas continue to grow, it is expected that the demand for recreational resources, such as those provided in the vicinity of the Proposed Action site, would also grow.

The self-guided Mesquite Mine Overlook Trail, approximately 0.8 miles in length, is located at the project site. This trail provides a view of the mining operations as well as information on the native plants and animals, the local geology, and multiple-use public lands. This trail was built as a joint effort by the Mine and the BLM, and was designed to educate visitors about contemporary mining practices, public land management, and the natural environment. An interpretive brochure for the trail was also developed by the Mine and the BLM. Several thousand visitors use the trail each year, including school children and local civic groups.

3.10.3 Wilderness Areas

As directed by FLPMA and the Wilderness Act of 1964, all BLM-managed lands in California were inventoried and specific areas were identified as wilderness study areas. Wilderness Areas (WAs) were designated by the California Desert Protection Act of October 31, 1994. WAs located in the vicinity of the mine site are listed in Table 3.10-2. No WA is closer than four miles to the mine site.



SOURCE: BLM, 1993

North 3/14/00

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Recreational Area Number 16

FIGURE 3.10-1

Table 3.10-1

Bureau of Land Management Visitor Count Data Selected Weekends from October 1989 To May 1990 For Recreation Area 16, Mesquite Mine

# of Days	Camping Units (1)	Visitors (2)
2- day weekends	270	945
3-day weekends	567	1,985
4- day weekends	265	938
Total (3)	1,102	3,858

Notes:

(1) The number of camping units in the area counted during weekends between October 1989 and May 1990.

(2) The number of visitors is estimated by multiplying the number of camping units observed by 3.5 persons per unit. ,

(3) Totals presented are less than the total number of visitors during the period from October 1989 to May 1990 because counts were not made every weekend.

Counts were conducted on an opportunistic basis. Actual totals may be greater than those shown. Use in 1991 and 1992 is projected to have increased at a rate of 5% each year.

Source: The Butler Roach Group, 1995

Table 3.10-2

Wilderness Areas in the Project Vicinity
Mesquite Mine

WA Number	WA	Approximate Distance/Direction from the Project Site
WA 35085	Indian Pass	11 miles/east
WA 35107	Picacho Peak	11 miles/east
WA 35092	Little Picacho Peak	14 miles/southeast
WA 35099	North Algodones Dunes	4 miles/west

Source: BLM, 1999.

Note: WA No. 35099, North Algodones Dunes, also includes the Algodones Dunes ACEC.

3.11 VISUAL RESOURCES

3.11.1 Scope

This section provides a discussion of the existing visual resources in the vicinity of the Mesquite Mine that could be affected by the construction and operation of the proposed mine expansions. The effect that a project could have on visual resources would not be limited to the project site. Rather, the degree to which a project could affect the visual quality of a landscape depends on the visual contrast created between a project and the surrounding existing landscape (BLM, 1986b).

All of the BLM-managed public lands in the CDCA (with the exception of a few small and scattered parcels), have been designated geographically into four multiple-use classes. Classification is based on the sensitivity of resources and kinds of uses within each geographic area. In the CDCA, visual resource management objectives in the multiple-use class guidelines provide the framework for determining appropriate levels of management, protection, and rehabilitation of BLM lands.

The Proposed Action site is located mostly within a Multiple-Use Class M designated area within the CDCA. Multiple-Use Class M provides for a wide variety of present and future uses such as mining, livestock grazing, energy and utility development, and recreation. Class M management is also designed to conserve desert resources and to mitigate damage to those resources that permitted uses may cause (BLM, 1980).

Outside of the CDCA area, Visual Resource Management (VRM) Classes are used to prescribe the amount of change allowed in the characteristic landscape. A parallel can be drawn between the Multiple-Use Classes applied to the CDCA and the VRM Classes applied to other BLM-managed lands. The objectives of Multiple-Use Class M are similar to the objectives of VRM Class III. VRM Class III areas have a "low visual sensitivity" resource value. The objective of this class is to at least partially retain the existing character of the landscape. The level of change to the characteristic landscape may be moderate. Management activities may attract attention, but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominate natural features of the characteristic landscape (BLM, 1984).

3.11.2 Visual Character

3.11.2.1 Mesquite Mine

The site lies adjacent to and north of SR°78, a rural, low-volume highway, carrying approximately 1,250 vehicles per day (Caltrans, 1992). The Mesquite Mine is an industrial-looking land use with noticeable features that include the previously described overburden and ore-residue piles, the ore conveyor and associated industrial dome, and buildings. Brownie Hill, a natural feature, rises more than 300°feet above the site. The proposed mine expansion area consists of relatively flat terrain containing a series of parallel drainage channels, separated by slightly elevated desert pavement areas.

Sparse vegetation and sun baked coarse gravels create a reddish-brown and green texture across much of the project area. Elevated overburden and heap leach piles from mining operations, smooth in texture and free of most vegetation prior to reclamation, contrast with the desert floor, both in texture and color. The mine itself consists of numerous man-made landforms rising to a height of over 200 feet, and three existing mine pits.

The project region is characteristic low desert, with little soil and sparse vegetation. The Chocolate Mountains, a narrow range running northwest to southeast, rise to the east of the project to an elevation of approximately 2,500 feet. The Chocolate Mountain "foothills" lie north, in the visual "backdrop" of the project site. The other element of visual interest is provided by the Algodones Dunes, a large sand dune area located approximately seven miles southwest of the mining area.

A more detailed description of existing land uses on and surrounding the mine site is provided in Section 3.9 (Land Use) of this EIR/EIS.

3.11.3 Scenic Quality

The majority of the project site has been disturbed by permitted mining activities. There is minimal disturbance to the surrounding areas. For the most part, the surrounding landscape has retained its natural character. Scenic quality refers to the value of a landscape from a visual perception point of view. Therefore, visual quality describes the overall scenic quality of the project site within the context of the surrounding environment.

The project site and surrounding lands are characterized by undulating terrain containing a series of parallel drainage channels with sparse vegetation. Drainage patterns and vegetation form reddish brown to dark gray and light to dark green lines across the desert terrain. The terrain is abruptly changed by occasional dark-colored, rugged hills and rock outcrops that reach elevations of up to 400 feet above the surrounding desert floor. The dark form of the Chocolate Mountains, located north of the project site, is seen as a visual backdrop north of SR°78. These mountains increase the area's scenic appeal. Man-made modifications to the area over the past 100 years have been related primarily to mineral exploration and development. These modifications, such as the Mesquite Mine, have changed the scenic character of the area on a local basis. Informal (unpaved) roads crosses much of the area.

3.11.4 Visibility

Part of the mine site is visible to the public primarily from SR°78, a rural, low-volume highway that runs adjacent to the southern and eastern sides of the project area. SR°78 is not a designated scenic route (Imperial County, 1993). Buildings, facilities, heap leach pads and overburden stockpile areas associated with the Mesquite Mine and processing facilities are visible to motorists traveling on SR°78. Given the general expansiveness and undeveloped nature of the area, the visual impression is locally dominated by these facilities.

Views in the region are expansive, particularly during periods of clear weather. The primary physical barrier to visibility is the Chocolate Mountains. Air pollution is the major factor limiting visibility in Imperial County.

The Mesquite Mine is partially illuminated at night to allow for nighttime operations. These lights create a glow in the sky above the mine facilities. This light source would be reduced with closure of the mine, anticipated to occur no later than the year 2001 under current economic conditions and permits. Some night operations would continue during Mine reclamation to complete the rinsing process. Approval of the Proposed Action would extend the period of operation until approximately 2006.

Two viewpoints were chosen to illustrate the most important views toward the project site along SR°78 (Figure 3.11-1). These represent a viewpoint along a travel route, or at a use area or a potential use area, where the view of a management activity would be most revealing (BLM, 1984). A description of the project site view from both identified viewpoints is presented below.

3.11.4.1 View Point No. 1

Figure 3.11-2 shows the existing view from View Point No. 1, which is from the shoulder of SR 78, approximately seven feet off the road surface at the southeastern edge of the project boundary, looking northwest at the project site. It should be noted that the view from an automobile passing this view point is partially blocked by the mine boundary fence and vegetation. The foreground view seen in Figure 3.11-2 consists of a chain-link fence along the project boundary, and natural desert terrain with native vegetation. The mid-ground consists of multiple benches of the heap leach pads in Sections 16 and 17 (See Figure 2.1-1). These heap leach pads, with their lighter color, smooth texture, and flat-topped forms, have resulted in a low modification to the characteristic landscape. A small segment of the Chocolate Mountains can be seen in the background at the northern end of this view point. Note: The existing topographic expression of the leach facility and the OISAs is temporary. Reclamation will involve modifying the linear nature of the existing facilities.

3.11.4.2 View Point No. 2

Figure 3.11-3 shows the existing view from View Point No. 2, which is from an elevated area across SR 78, approximately three quarters of a mile north of the southeastern edge of the project boundary looking along the northeastern border of the project site. It should be noted that the view from an automobile passing this view point is partially blocked by the fence and vegetation. The foreground view seen in Figure 3.11-3 consists of a chain-link fence along the project boundary, and natural desert terrain with native vegetation. In the mid-ground lies a series of overburden/interburden piles associated with mining operations, which are visible below and at the horizon at the center of the field. These stockpiles, with their lighter color, smooth texture, and flat-topped forms, have resulted in a temporary (pre-reclamation) low modification to the natural landscape. The Chocolate Mountains are seen intermittently, over the tops of the overburden piles in the background of this view point.

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Legend

- Section Lines
- Perimeter Fence
- North Half Section Boundary
- Proposed Plan of Operations Boundary
- Existing Diversions
- Facility Boundaries
- Topographic Contour (AMSL)
- # View Point
- Proposed Action Expansions of OISAs and Heap Leach Pads

Scale (in feet)
1000 0 750 1500 3000

North

7/7/00

SOURCE: Newmont Mining Corporation and BRG Consulting, Inc. 2000

3.11-5

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View Point Locations

FIGURE 3.11-1



SOURCE: BRG Consulting, Inc., 2000.

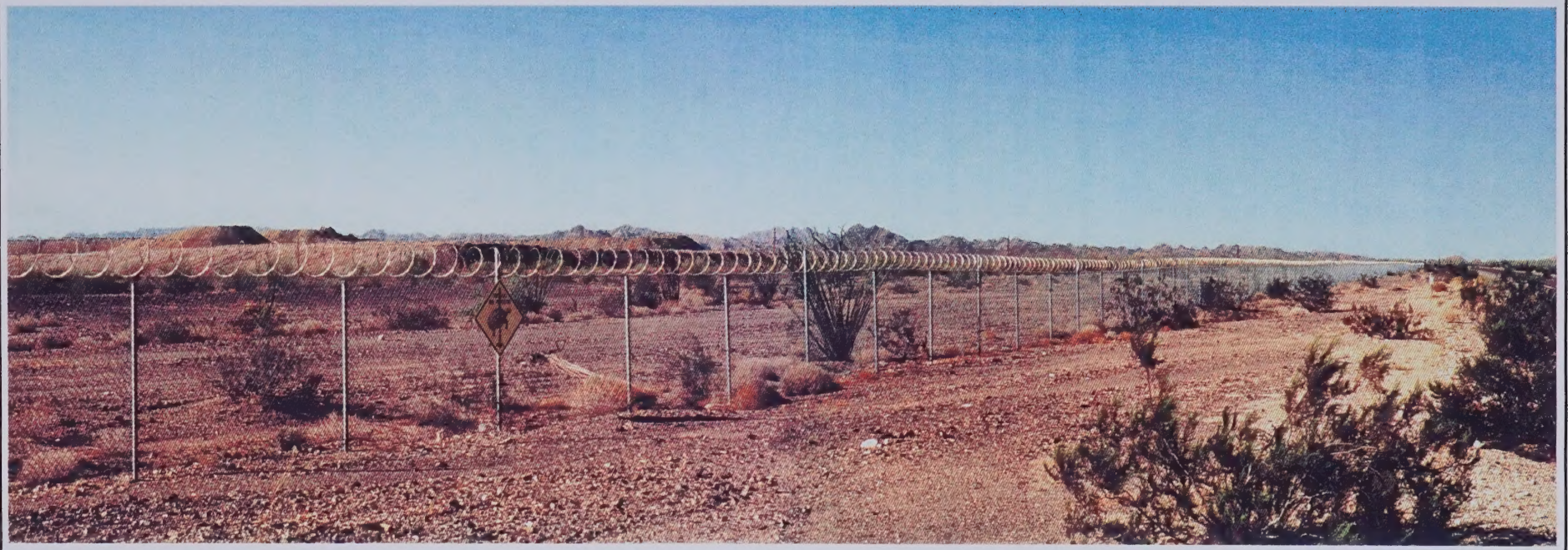
No Scale
6/20/00

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Mesquite Mine Expansion EIR/EIS

Existing Conditions
View Point No. 1

FIGURE
3.11-2



SOURCE: BRG Consulting, Inc., 2000.

No Scale
1/3/00

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Mesquite Mine Expansion EIR/EIS

Existing Conditions
View Point No. 2

FIGURE
3.11-3

3.12 ENVIRONMENTAL HEALTH AND PUBLIC SAFETY

Existing environmental health and safety conditions at the Mesquite Mine result from ongoing mining operations. The physical characteristics of the mine consist of open pits, heap leach pads and gold recovery facilities and various ancillary facilities typical of open-pit gold mine operations. These facilities are described in detail in Section 2.1.5. The proposed mine expansion for which this EIR/EIS is prepared would increase the disturbed area by approximately 10 percent in order to extend mine operations to 2006.

Various measures have been incorporated into existing mine operations to minimize the potential for health and safety impacts to mine employees and the general public. These measures include operational requirements set forth by the Mine Safety and Health Administration (MSHA), California Occupational Safety and Health Administration (Cal-OSHA) and various other federal and state agencies that have been observed by the Mine since inception of operations in 1984. Observance and enforcement of these regulations and guidelines by the Mine is ongoing.

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3.13 SOCIOECONOMICS

This section discusses the existing socioeconomic environment and identifies the potential socioeconomic impacts that could result from the development of the Proposed Action.

3.13.1 Scope

The scope of the socioeconomics discussion presented here and in Chapter 4.0, Section 4.1.13, is based on public and interested agency input and is limited to employment, income, and demographic effects within Imperial County because the majority of project-related effects would occur in Imperial County.

3.13.2 Employment and Income

3.13.2.1 Employment and Income in Imperial County

In 1997, the County of Imperial's civilian labor force was estimated to be 56,800 persons. Of this number, 41,800 were employed and 15,000 were unemployed. The unemployment rate was 26.5 percent (U.S. Bureau of the Census, 1997).

In past years, the agricultural sector was the largest employer in Imperial County. Since 1991, Government employment in Imperial County has increased by over 2,000 jobs, primarily associated with increased employment at the Calipatria State Prison, a new State prison at Seeley, and increased employment associated with the Border Crossing in Calexico. During this same period, agricultural jobs declined in Imperial County.

The largest sector, by earnings, in Imperial County in 1991 was government, with 32.8 percent of the total, followed by services with 18.2 percent of the total. Mining provided 3.1 percent of earnings in 1991. This share declined to 1.4 percent by the year 1997. Mining provided the highest earnings per job in 1991 ($39,337) and remains among the highest earnings per job sectors in the local economy. The 1996 per capita personal income for Imperial County was estimated to be $14,394. This was 65.7 percent of the per capita personal income for the State of California ($21,895) and 79.4 percent of the per capita personal income of the United States ($18,136).

3.13.2.2 Existing Employment and Income at the Proposed Site

Most of the mine property is owned by Hospah Coal Company and leased to Santa Fe Pacific Gold Corporation (SFPGC), and operated by Newmont Gold Company. SFPGC and Newmont Gold Company are subsidiaries of Newmont Mining Corporation. Newmont Mining Corporation is a Delaware corporation headquartered in Denver, Colorado. Prior to June 25, 1993, Gold Fields operated the Mesquite Mine. The direct and indirect employment and earnings associated with the Mesquite Mine are summarized below.

As of June 1999, the gold mine employs 164 workers, down from 370 workers in fiscal year (FY) ending September 1992. Mine workers commute from both California and Arizona (Table 3.13-1). Paid salaries are approximately $7.5 million dollars plus benefits of $3 million. The average wage paid to employees for FY 1999 was approximately $45,000 with an additional $17,500 in benefits paid per worker (Newmont Gold Company, 1999).

The mine is scheduled to close no later than mid 2001 given current gold prices. Therefore, the employment, income, and revenues currently generated by the mine (Table 3.13-2) would be lost. Other local employers include the Glamis Beach Store, various aggregate producers who periodically mine aggregate in the area, and BLM which manages the adjacent federal lands. Because it is not expected that these jobs would be impacted by the Proposed Action and because many of these jobs are seasonal, no effort has been made to quantify employment and earnings associated with these activities.

3.13.3 Demographics

The following section includes a discussion of various demographic issues applicable to the Proposed Action. To obtain a better understanding of the demographic conditions in Imperial County, a comparison of similar demographic characteristics for the State of California, and the United States is included.

3.13.3.1 Selected Demographic Statistics

Selected demographic statistics (1996) for Imperial County, the State of California, and the United States are shown on Table 3.13-3. The total population of Imperial County was estimated to be 140,931 in 1996. This represented 0.4 percent of the population of the State of California (31,762,190) and 0.05 percent of the population of the United States (265,463,000). The number of persons per household in the County of Imperial was estimated to be 3.26 in 1990. This is 17 percent larger than the average household size in the State of California (2.79) and 24 percent larger than the average household size in the United States (2.63).

Table 3.13-1

Distribution of Mesquite Mine Employees June 9, 1999

California	
Selected Areas	**Number of Employees**
Brawley	36
Herber	2
El Centro	14
Calipatria	2
Calexico	7
Imperial	16
Blythe	9
Palo Verde	1
Seeley	2
Winterhaven	3
Westmorland	5
Holtville	15
Niland	1
TOTAL CALIFORNIA	113
Arizona	
Yuma	49
San Luis	2
TOTAL ARIZONA	51
MINE TOTAL	**164**

Source: Mesquite Mine, 1999.

Table 3.13-2

Fiscal Statistics
Mesquite Mine

Selected Financial Variables	1998
Spending	$54,061,226
Taxes:	
Sales Tax	$76,596
Property Tax	$383,761
Federal Income Tax	$1,290,082
State Income Tax	$295,505
Federal Unemployment Tax	$16,881
State Unemployment Tax	$72,220
Rent	$6,027
Royalties	$3,027

Source: Newmont Mining Corporation, 1999.

Table 3.13-3

1996 Selected Demographic Statistics Imperial County, State Of California, United States

Selected Variables	Imperial County	State of California	United States
Total Population	140,931[a]	31,762,190[a]	265,463,000[b]
Per Capita Personal Income (1996)	$14,394[b]	$21,895[b]	$18,136[b]

Source: (a) U.S. Dept. of Commerce Bureau of Economic Analysis, 1999.
(b) U.S. Bureau of the Census, 1999.

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3.14 PUBLIC SERVICES AND UTILITIES

3.14.1 Scope

This section discusses the public services available within Imperial County and the utilities currently existing at the Mesquite Mine.

3.14.2 Existing Public Services

The Mesquite Mine is located within a sparsely inhabited area of Imperial County, where the local population base is insufficient to maintain separate community service facilities. Therefore, most facilities, such as police and fire stations, schools, libraries, and hospitals, are located in the more populous areas to the west. Brawley, an incorporated city about 35 miles west of the proposed site, is the closest community providing a full range of public services. The next closest, El Centro, California, is about 50 miles to the southwest.

3.14.2.1 Police, Fire Protection, and Medical Services

An emergency vehicle and first aid station with trained personnel is maintained at the Mesquite Mine to administer treatment in the event of any emergency. In addition, a heliport is located on-site to coordinate with available medical air evacuation services. A security force and fire fighting system and equipment are provided on the Mesquite Mine site as well.

3.14.2.2 Community Facilities

Schools

There are 52 K-12 schools in Imperial County. There are three advanced education institutions within or near the Imperial County area. They include: the Imperial Valley College (two-year), in Imperial, California; San Diego State University, Imperial Valley Campus, in Calexico, California; and Arizona Western College (two year) located east of Yuma, Arizona.

Parks and Recreational Facilities

Numerous recreational opportunities are available in Imperial County. These include, but are not limited to, sand dune areas, desert areas, the Salton Sea, the Colorado River, and local community parks. These recreational facilities are managed by the BLM, the County, or the City in which they are located. There are 46 parks and 20 playgrounds located within the incorporated cities and unincorporated communities of Imperial County.

Much of the public lands used for recreation in Imperial County are managed by the BLM. The types of recreational activities these areas offer include:

- Open Space
- Nature Study and Resource-Oriented Recreation
- Education and Research
- Wilderness
- OHV Use
- Organized Competitive Vehicle Events

Three Recreation Area Management Plans have been developed for the Imperial County area. They include: the ISDRA; the McCain Valley Resource Conservation Area (in eastern San Diego County); and the Jacumba Outstanding Natural Area.

Recreational facilities located in the vicinity of the Proposed Action are discussed in Section 3.1.10, Recreational Resources, of this EIR/EIS.

Libraries

There are nine public libraries and one branch of the County Library located within the various communities of Imperial County.

Solid Waste Facilities

There are 11 Class III solid waste disposal sites within Imperial County. Of this total, ten are operated by the County and one is privately operated. The Class III landfills in Imperial County currently provide in excess of 50 years of capacity, assuming the successful implementation of AB 939-mandated recycling programs. Additionally, a permit exemption (SWIS#13-AA0025) for a landfill at the Mesquite Mine site on land controlled by Newmont for disposal of Class III inert waste (glass, scrap metal, concrete) was renewed on July 1, 1999 by Imperial County Department of Environmental Health Services.

3.14.3 Utilities

3.14.3.1 Electricity

Electric power is provided to the most populous areas of the County by the Imperial Irrigation District (IID). Electric power is provided to the Mesquite Mine via an existing IID seven-mile, 92 kV transmission line and a 161/92 kV tap substation.

Communications Systems

Telephone service is currently provided at the Mesquite Mine via an on-site microwave station.

Water

The Mesquite Mine well field includes three large diameter wells, large high production pumps, two depth monitoring wells, a five-mile long electric power line and a four-mile long above-ground pipeline.

As discussed in Chapter 3.0, Section 3.1.2, Water Resources, of this EIR/EIS, the Mesquite Mine well field is approved for extracting up to 4,033 acre-feet of water per year, based on maximum estimates of potential water demands for dust control, heap leaching, potable water, construction water and evaporation (CUP No. 684-84). The actual water use between 1987 and 1999 varied from 500 to 1,500 acre-feet per year.

Water from this source is not suitable for drinking without prior treatment. Newmont historically treated a portion of this water (less than 50 gpm) by a reverse osmosis process for potable uses at the Mesquite Mine.

Sanitation

Public sewer services in the larger communities are provided by municipal governments or special districts. In less densely populated areas, individual sewage disposal systems are more common. The Mesquite Mine uses individual sewage disposal methods (i.e., septic tanks).

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4 Environmental Consequences

4.1 PROPOSED ACTION

4.1.1 Geology/Soils/Mineral Resources

4.1.1.1 Assumptions and Assessment Guidelines

This section assesses impacts to geologic, soils, and mineral resources that could result from the proposed Mesquite Mine expansion. A significant impact would be one in which the Proposed Action would:

- Result in substantial uncontrolled changes in natural erosion and sediment transport in the mine area or in the surrounding desert environment.
- Be damaged, destroyed, or expose a substantial number of people to seismic hazards, as a direct consequence of a geologic event.
- Release substantial quantities of ore processing fluid from the leach pad expansion into the environment as a result of a geologic event.
- Substantially restrict the ability to utilize geologic (mineral) resources.

4.1.1.2 Impacts of the Proposed Action

Soils

Four of the five soil types in the project area have minimal or no erosion potential (Borst, 1983). The one soil type susceptible to displacement is unidentified sandy loam, which comprises the smallest percentage of the five (i.e., estimated at about 10 percent of the total soil present). This type of soil generally occurs on steeper slopes in the project area, which are naturally erosion prone.

Runoff from local precipitation could cause minor erosion on the manufactured slopes of the OISAs. Currently, the tops of the overburden/interburden piles are graded to avoid concentrating runoff to slope areas. Based on experience at the Mesquite Mine with this design, along with the coarse-grained nature and high infiltration characteristic of dumped material, the erosion potential for the new OISA's is low.

The Mesquite Mine is crossed by a channel that carries stormwater through the site (Figure 2.1-1). It is necessary to convey stormwater around project facilities to allow for safe operations and for long-term stability of the mine pits, OISAs and heaps. The proposed expansion would require construction of new drainage diversions at three locations near the mine pits: the East Rainbow Pit Diversion Channel in Sections 3 and 10; the North Extension Diversion Channel in the north half of Section 5; and the Vista Diversion Channel in Sections 4, 8 and 9.

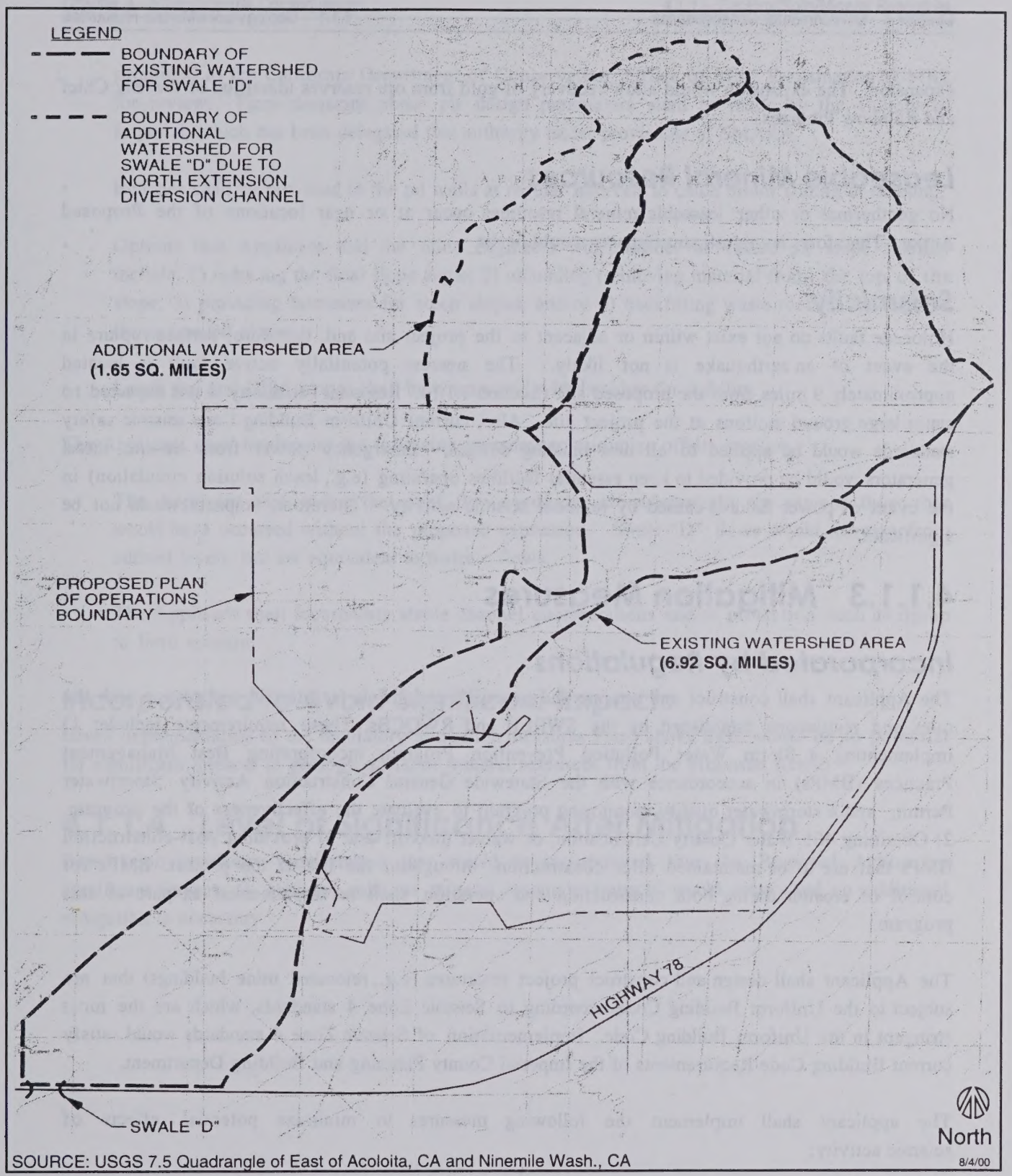
The East Rainbow Diversion Channel and the Vista Diversion Channel are short diversions that do not materially change the watershed area or discharge location compared to existing flows. Both would be designed to fully convey stormwater flows around facilities without increasing flood hazards or otherwise affecting the hydrology of the area. The flow paths will be slightly longer through the new diversion sections, resulting in a slightly flatter overall gradient that will not be prone to above-normal levels of erosion.

The North Extension Diversion Channel will result in runoff being diverted through the mine area from approximately 1.65 square miles of additional watershed that drains to the west of the mine area under existing conditions, as shown in Figure 4.1.1-1. The North Extension Diversion Channel would be designed to accommodate the additional runoff from the 1.7 m^2 watershed and the fully convey stormwater flows through the mine area without adversely affecting the hydrology of the area. The flow path for runoff from this additional area will be lengthened, reducing the overall gradient.

The Proposed Action would be constructed and operated in accordance with a Stormwater Pollution Prevention Plan (SWPPP) as required under the State of California NPDES General Construction Activity Permit. In accordance with the General Permit, a SWPPP identifying Best Management Practices to control erosion and a Monitoring Plan shall be developed and implemented concurrently with commencement of grading activities, and a complete and accurate Notice of Intent (NOI) shall be filed with the SWRCB. Upon completion of construction, and throughout the project's life, the Proposed Action may also require a NPDES permit for any point source discharge in the surface waters and State Waste Discharge Requirements for discharges to land. Therefore, erosion impacts would not be significant.

Mineral Resources

Condemnation borings drilled by Mesquite Mine geologists have been used to determine the limits of gold ore bodies. These borings indicate that valuable mineral resources common to the project area do not exist beneath the proposed locations of OISAs or the leach pad expansion. Therefore, adverse impacts to valuable economic mineral resources would not occur as a result of the proposed



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Mesquite Mine Expansion EIR/EIS

Swale "D" Drainage Area

FIGURE 4.1.1-1

expansion. The expansion would allow recovery of gold from ore reserves identified in the Big Chief and Rainbow Pit areas.

Leaseable Mineral Resources

No geothermal or other leaseable mineral resources occur at or near locations of the Proposed Action. Therefore, no significant impacts would occur.

Seismicity

Holocene faults do not exist within or adjacent to the project site and, therefore, surface rupture in the event of an earthquake is not likely. The nearest potentially active fault is located approximately 9 miles from the proposed site (Section 3.1.6). Regional seismicity is not expected to cause large ground motions at the project site. Also, current Uniform Building Code seismic safety standards would be applied to all new building designs. Emergency power from on-site diesel generators would be provided to keep essential facilities operating (e.g., leach solution circulation) in the event of power failures caused by regional seismic activity. Therefore, impacts would not be significant.

4.1.1.3 Mitigation Measures

Incorporated by Regulations

The Applicant shall construct and operate the proposed expansion facilities in accordance with the rules and regulations established by the SWRCB and RWQCBs. These requirements include: 1) implementing a Storm Water Pollution Prevention Program incorporating Best Management Practices (BMPs) in acccordance with the Statewide General Construction Activity Stormwater Permit; and a stormwater quality monitoring program to evaluate the effectiveness of the program. 2) Obtaining 401 Water Quality Certification, or waiver thereof; and 3) providing post-construction BMPs that are to be maintained after construction, throughout the life of the project. BMPs for control of erosion during both construction and operation shall be implemented as part of this program.

The Applicant shall design and construct project structures (e.g., relocated mine buildings) that are subject to the Uniform Building Code according to Seismic Zone 4 standards, which are the most stringent in the Uniform Building Code. Implementation of Seismic Zone 4 standards would satisfy current Building Code Requirements of the Imperial County Planning and Building Department.

The applicant shall implement the following measures to minimize potential effects of seismic activity:

- The Applicant shall complete final pit wall design in conformance with SMARA requirements. Pit slope parameters will be determined and reviewed by California registered civil engineers, with appropriate safety factors based on their professional experience. Final pit design shall be

submitted to the California Department of Conservation, Office of Mine Reclamation (OMR), for review. Final decisions about pit design parameters shall be made by the County of Imperial, which has been delegated this authority under provisions of SMARA.

- Benches shall be provided in the pit walls at regular intervals to catch minor sliding or raveling.
- Options that Applicant and the mine engineers will consider to ensure pit slope stability include: 1) reducing the final slope angle; 2) unloading (removing material from) the top of the slope; 3) providing buttresses for steep slopes; and/or 4) backfilling waste rock at the base of the excavated slopes.
- Leach pad and OISA slopes shall be constructed with benches for stability.

The Applicant shall implement the following measures to minimize offsite erosion:

- The Applicant shall ensure that peak flow conditions are substantially the same as those that would have occurred without the proposed expansion. Swale "D" flows would increase from current levels, but are equivalent to historic flows.
- The Applicant shall incorporate stable channel configurations and/or protection such as riprap to limit erosion.

Incorporated to Avoid Significant Impacts

Given implementation of the regulatory mitigation measures listed above there would be no potential for significant impacts to geology, soils, or mineral resources from the Proposed Action.

4.1.1.4 Level of Significance After Mitigation

Based upon regulatory requirements that would be incorporated into the Proposed Action no significant impacts to geology, soils, or mineral resources impacts would occur, and no additional mitigation is necessary.

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4.1.2 Water Resources

4.1.2.1 Assumptions and Assessment Guidelines

This section assesses impacts to water resources that could potentially result from the Proposed Action. This assessment also identifies measures that will be taken to comply with state water quality control regulations, and control factors incorporated into the project design, which would reduce potential impacts to below the level of significance. For purposes of this analysis, a significant impact would be one which:

- Alters surface flow conditions resulting from short-term precipitation events in a manner that is uncontrolled or substantially changes existing flow conditions.
- Results in stormwater flow conditions at Highway 78 that exceed the capacity of existing highway wash crossings.
- Degrades precipitation runoff quality such that other uses of the water would be substantially limited.
- Degrades ground water quality or reduces water quantity such that the beneficial uses of water would be substantially limited.
- Substantially reduces ground water recharge to the Amos-Ogilby hydrologic basin.
- Results in an uncompensated loss of Waters of the United States.

As discussed in Section 2.1.5, the primary source of water for dust control, ore processing and other needs would be the existing water supply wells and pit dewatering. The rate and quantity of water extraction from these wells would remain within the amounts already permitted for the Mesquite Mine. This water withdrawal has been analyzed in prior CEQA/NEPA documents for the Mesquite Mine and found to have impacts that are less than significant (Environmental Solutions, Inc., 1987).

4.1.2.2 Impacts of the Proposed Action

Surface Water

Certain aspects of mine area construction would have the potential to alter infiltration and runoff. These include surface compaction on site roads, filling of minor drainages, the construction of OISAs, and the capture of direct precipitation in the mine pits. Other than the small new leach pad expansion which would capture direct precipitation, new impermeable surfaces (e.g., roofs, asphalt paving) are not proposed. Onsite roads would be constructed with the minimum necessary grading. Runoff from most precipitation events would be absorbed or evaporated. During infrequent large storms, there may be increased runoff from road surfaces, however, any such increase from the Mine would not be significant

because Mine roads would cover represent only a small fraction of the surface area available for infiltration, and because any increase in runoff from the roads would be offset by capture of direct precipitation in the Mine pits and infiltration into the OISAs. Upstream diversions would preclude significant capture of runoff by the Mine pits. The OISAs are expected to have a higher than normal infiltration rate because of the porous nature of the material. For these reasons, a net reduction in runoff from the Mine area is expected.

The proposed expansion would require construction of three new drainage diversion channels. The East Rainbow Diversion Channel and the Vista Diversion Channel are short diversions that do not materially change the watershed area or discharge location compared to existing flows. The North Extension Diversion Channel will result in runoff being diverted through the mine area from approximately 1.65 square miles of additional watershed that drains to the west of the mine area under existing conditions, as shown in Figure 4.1.1-1 under Geology/Soils. The flow path for runoff in each of the three diversions would be lengthened, resulting in a slightly flatter overall gradient that would not be prone to above-normal levels of erosion. The additional watershed area contributing flow through the mine area would not result in a significant impact because the channels would be designed and maintained to provide protection to the mine facilities, and because downgradient of the diversions the wide braided wash network would naturally accommodate the increased flow without substantial changes to flow conditions. Changes to flows in individual channels would not be unlike naturally occurring changes that are characteristic of braided washes.

Based on the existing U.S.G.S. topographic map of the area, and the locations of proposed diversions, channel slopes of the existing washes were compared to the proposed diversion channel slopes. The four primary washes upstream from the North Extension Diversion Channel have slopes ranging from 1.8 to 2.4 percent. The slope of the proposed North Extension Diversion Channel is 0.5 percent (per Hanson, April 1998). Below the diversion channel, the natural washes have slopes of 1.2 to 1.4 percent. The East Rainbow Diversion has a proposed slope of 0.8 percent. The two major washes upstream from it have slopes of 2.1 and 2.2 percent. Below the diversion, the natural washes decrease in slope to 1.8 and 1.9 percent.

The diversion channel berm would be protected with riprap at the transition where it connects with the natural washes, in order to minimize erosion. The decreased slope in the diversion channels (0.5 percent) would serve to slow down the rate of water flow. Flow rates would increase when the diversion delivers the water to the natural channel downstream. Peak flows for the North Extension Diversion Channel and the East Rainbow Diversion under a 100-year, 6-hour storm event are projected to reach 2,330 and 300 cfs, respectively (Hanson, April 1998).

A hydrologic/hydraulic evaluation was completed to confirm that flow from the additional watershed area diverted by the North Extension Diversion Channel would not adversely impact Highway 78. The affected wash crosses Highway 78 at a shallow wide channel referred to as "Swale D" (Figure 4.1.1-1). The analysis was performed using U.S. Department of Agriculture Soil Conservation Service rainfall distribution curves and the "HEC-1" computer modeling program developed by the COE. Detailed modeling results are provided in Hanson, 1999. The wash at Swale D is approximately 1,100 feet wide

and has a total depth of about 3.5 feet. Modeling indicates that the normal depth of the 100-year, 24-hour storm runoff at Swale D with the proposed North Extension Diversion Channel in place would be about 2.3 feet deep. The estimated normal depth of the 500-year, 24-hour storm runoff would be about 2.7 feet. Because even the 500-year, 24-hour storm would stay within the approximately 3.5 foot deep swale. The impact to hydrology at the Swale D wash crossing is considered less than significant. These results indicate that the likelihood of a 24-hour storm runoff event overtopping the swale is less than one-in-five-hundred for any given year. Nevertheless, Newmont will be required to consult with Caltrans prior to modifying flows to Swale D, to assure that Caltrans requirements for additional erosion protection, if any, are satisfied.

A review was performed by the owner of the Mesquite Landfill project, Arid Operations, Inc., to determine if the expansion would affect the landfill project. Arid Operations, Inc. determined that based on its preliminary review, the proposed expansion would not significantly affect the landfill drainage design.

Hydrocarbon fuels, ore processing reagents, and other potentially hazardous materials would be stored in aboveground tanks or other appropriate containers at the Mine site. Bulk petroleum products and reagents would be stored within containment areas to prevent uncontrolled releases. There would be the potential for minor hydrocarbon leaks/spills from equipment (e.g., trucks) that would be used for mining operations. Any such spills likely would be small, and easily excavated and removed for subsequent treatment and/or removal from the site.

The heap leach pad would be operated in accordance with CCR Title 27 regulations for mining units, and Newmont would be required to operate the heap leach pad pursuant to WDRs from the RWQCB that implement appropriate provisions of Title 27. These requirements include criteria for protecting ore processing facilities from run-on and for operating in a manner that protects against release of process fluids or other constituents that may adversely affect surface water quality. With these requirements in place, significant effects to surface water quality are not expected. The Mesquite Mine has operated for 15 years under this regulatory framework, and significant effects to surface water quality have not occurred.

Figure 3.2-5 shows the location of mine pit lakes for current mining conditions. The proposed expansion of the Big Chief and Rainbow mining areas would result in changes to the configuration of the pit lakes. The pit lakes would remain isolated from naturally-occurring surface water and would have no adverse or beneficial impact to surface water resources. Potential affects of the pit lakes on ground water resources and the chemistry of water expected to occur in the pit lakes are described under the topics of Ground Water Quality and Ground Water Quantity in the following sections.

Waters of the United States

As described in Section 3.2.2.1, consultants conducted surveys to identify federal jurisdictional "Waters of the United States" including wetlands in and around the project area. See Jones & Stokes, August and Sept. 1999 for details. The surveys included each of the principal washes within the project area, as well

as tributaries, to determine which met the criteria of "waters" and "Waters of the United States." No jurisdictional wetlands were identified within the existing Mine area. The Proposed Action would result in new surface disturbances that would include 24.97 acres considered by the consultants to qualify as "Waters of the United States." Of that area, approximately 15.93 acres would be in areas already permitted for Mine disturbance by the BLM and Imperial County, and 9.04 acres are located in areas without current permits. The actual acreage of Waters of the U.S. will be determined by the ACOE as part of the concurrent Section 404 process. Impacts to the Waters of the U.S. are considered significant by the Army Corps of Engineers. Locations of the delineated waters relative to the Proposed and Alternative expansion areas are shown in Figure 4.1.2-1. Acre totals by expansion area are shown in Table 4.1.2-1.

Impacts to Waters of the U.S. by the proposed pit expansions are unavoidable if known ore bodies at the mine site are to be accessed and processed. Surface water drainages must also be diverted around the pits in order to minimize accumulation of water in the pits. The East Rainbow Diversion is located immediately adjacent to the proposed East Rainbow Pit Extension, thus minimizing additional disturbance to waters of the U.S. It would have been desirable, as well, to keep the North Diversion channel close to the proposed Big Chief North Extension. That, however, would require water to flow uphill in order to connect to the north end of the Vista Diversion channel through the Mine area. The North Diversion channel location that has been proposed allows for gravity flow to the Vista Diversion channel. OISA locations were chosen to minimize haul distances and surface disturbance .

It is proposed that any impacts to Waters of the U.S. will be mitigated through the compensation process for desert tortoise habitat. It is anticipated that title to more than 1,300 acres of high-quality tortoise habitat would be conveyed by Newmont to the BLM, as mitigation for Project-related loss of desert tortoise habitat. Please see Section 4.1.3 for a more detailed discussion of biological impacts and compensation. Further provisions of this compensation provide that the lands to be conveyed will include and preserve microphyll woodland at a 3:1 mitigation ratio. Consistent with the Section 404 process, appropriate acres of Waters of the U.S. will be preserved in this transaction as well. With preservation of the waters within the proposed compensation area, impacts to Waters of the U.S. would be considered less than significant.

No additional Waters of the U.S. will be dredged or filled as a result of reclamation activities described in Section 2.1.7. Only in the areas disturbed by prior mining activities will the ground surface be prepared and then seeded with native plants. Furthermore, the relationship between planned reclamation measures and mine expansion mitigation measures was reviewed, and no additional impacts to mine expansion mitigation measures were identified.



SOURCE: Newmont Gold Company, 1999, 2000; Jones and Stokes, 1999.

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4.1.2-5

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Mesquite Mine Expansion EIR/EIS

Waters of the U.S.

FIGURE

4.1.2-1

Table 4.1.2-1

Estimated Waters of the U.S. (Acres) By Proposed Expansion Area Proposed Action, Mesquite Mine Expansion

Expansion Area	Proposed Action		
	Previously Permitted	Not Permitted	TOTAL
North Extension, Big Chief Pit	0.00	1.84	1.84
Big Chief Pit South and Southeast Extensions (a)	0.00	0.00	0.00
East Rainbow Pit Extension	3.68	0.70	4.38
Big Chief West OISA	0.00	0.00	0.00
East Rainbow North OISA	1.70 (b)	0.00	1.70
East Rainbow South OISA	8.25	3.48 (b)	11.73
East Rainbow Diversion Channel	2.30	0.24	2.54
North Extension Diversion Channel	0	2.78	2.78
Heap Leach Pad No. 6 Expansion	NA (c)	NA (c)	NA (c)
TOTALS	**15.93**	**9.04**	**24.97**

Source: Jones & Stokes, 1999, 2000; BRG Consulting, Inc., 2000.

(a) The area was previously disturbed by ancillary mining activities.

(b) Extrapolated by BRG Consulting, Inc. from Jones & Stokes data.

(c) All of Section 16 was previously permitted for heap leach pad disturbance, and compensated.

Ground Water Quality

Potential impacts to ground water quality at the site could occur in two general ways:

- If sufficient infiltration were to occur, dissolved constituents could be transported downward to ground water.
- Mine pit lakes could impact the quality of water surrounding the pits.

The potential for these impacts to occur is further described in the following subsections.

Infiltration of Dissolved Constituents

Ore that is excavated under the proposed expansion would be processed at heap leach facilities that would be contiguous with existing facilities. Ore processing operations could leak or spill processing fluids if the ore processing facilities are not appropriately designed, constructed and operated. Newmont would be required to construct and operate the leach pad expansion in accordance with CCR Title 27 and with WDRs as approved by the RWQCB. These regulations and the requirement for WDRs to be issued are designed to protect water quality. The RWQCB would require routine monitoring and reporting of relevant operational parameters and leak detection systems. With these requirements, significant ground water quality impacts are not expected to occur from ore processing activities related to the proposed expansion. The Mesquite Mine has operated for 15 years under this regulatory framework and impacts to ground water quality have not occurred.

Petroleum products (e.g., fuels, lube oil, hydraulic oil) used to support mining activities could impact ground water if a substantial leak were to occur. Fuel and oil storage already occur at the mine and the expansion would utilize existing facilities. The proposed expansion would not increase the potential for fuel and oil storage to impact ground water, but it would prolong the ongoing use of these products onsite. To mitigate the potential for fuel and oil to impact ground water, bulk petroleum products are stored aboveground in designated areas with appropriate secondary containment for potential spills, and these areas are monitored to assure that leakage is not occurring. With these measures, fuels and oil use at the site are not expected to impact ground water quality.

Precipitation infiltrating through OISAs could carry soluble constituents from the overburden/ interburden if high levels of soluble constituents were to be present, or if overburden/interburden were to have a net acid generating potential. Extensive geochemical testing has been performed on the Mesquite Mine overburden/interburden, as described in Section 3.1.3.4 and the Baker study, 1999. Soluble metals concentrations in these materials are generally low and the material is not acid generating. Because of these characteristics, and because of the low annual precipitation that occurs at the site, the OISAs would not have a significant impact on ground water quality.

Mine Pit Lakes

Modeling was performed (described in detail in Baker, 1999) to evaluate potential pit water conditions. The primary factors affecting the chemistry of the water in the mine pits will be the naturally occurring

chemistry of ground water surrounding the pits, and the high evaporation rate which will concentrate dissolved constituents introduced to the pit by ground water inflow. The pit lake water chemistry and ground water quality impact conclusions in this section are generally valid for the rock units planned to be mined.

During mining, ground water seeping into the pits that does not evaporate would be removed and used for dust control. After mining in each pit is completed, the respective pit lake would fill with water until the lake surface is large enough to evaporate water at the same rate as inflow occurs. Based on flow net calculations described in Section 3.2.3.1, ground water flow through the upper 300 feet of the saturated zone in the area of the mine pits is approximately 100 gpm. For this amount of steady-state flow into the mine pits, and given the approximately 80 inches per year of lake evaporation that is characteristic of the site climate, the combined total surface area of the pit lakes would be about 24 acres.

Pit lakes are expected to occur in the bottoms of the Big Chief North, Big Chief South, Big Chief Southeast, East Rainbow and Vista Pits. The actual time required for each lake to fill to its equilibrium level will depend upon the as-built configuration of the pits. In general, the individual pits are expected to reach their equilibrium level within times ranging from several years to several decades, depending upon the configuration of each pit. The depths of the lakes will vary from pit to pit, and may be shallow to relatively deep (i.e., depths may vary from on the order of ten feet to more than 100 feet).

Ground water in the pit areas is deep below the ground surface (Section 3.2.3.1). Therefore, the pit lake surfaces will be far below the pit rims and overtopping of the pit rims will not occur.

Initially, the pit water chemistry will be similar to the existing pit water (Table 3.2-7), with TDS concentrations generally in the 1,500 to 4,000 mg/L range. At the time that each pit lake reaches its equilibrium surface level, TDS concentrations are expected to generally range from about 5,000 to more than 10,000 mg/L (Baker Consultants, Inc., 1999). Because evaporation is the primary source of outflow, and because of the high evaporation rate and low precipitation, over the long-term the TDS will increase and the lakes will become saline with dissolved constituent concentrations near saturation. This evapoconcentration will result in the long-term chemistry of the pit lakes under the Proposed Action being approximately the same as the long-term water chemistry described in Section 3.2.3.5 for the existing mine pits. The reader is referred to that section for a more detailed discussion of water chemistry, including a comparison of pit lake water quality to certain water quality standards.

The additional impacts that would occur for the Proposed Action (compared to the currently permitted pits) are that: (1) the total area and volume of water in the pit lakes will be larger; and (2) the rate at which, evapoconcentration will occur may be different. In general, it is expected that the individual lakes that would occur for the Proposed Action would have a volume/surface area ratio that would be either similar to or larger than lakes that would occur in the currently permitted mine pits, which would result in a similar or slower rate of evapoconcentration.

Modeling indicates that for the out-of-pit OISA configuration of the Proposed Action, ground water would not flow through any of the mine pits. The pit lakes will be evaporative sinks, and the ground

water flow direction will be toward the pits from all directions. Because the ground water flow will be toward the pits from all directions, the build-up of dissolved constituents in the pit lakes will not affect water quality away from the mine pits.

Saline lakes would be expected to occur in the bottom of the mine pits as previously described in this section. The impact of these lakes on ground water quality will be less than significant because:

- The long-term pit lake chemistry will not be substantially different under the Proposed Action compared to that which would occur for the currently permitted pits.
- The ground water gradient will be toward the pits from all directions, so the buildup of dissolved constituents will not affect water quality away from the mine pits.
- No current or foreseeable beneficial uses of water would be affected.

Ground Water Quantity

Due to evaporation of water from the mine pit lakes and the relatively low permeability of rock surrounding the mine pits (Table 3.2-3), the pit lake surfaces will equilibrate at an elevation that is lower than the top of the saturated zone as it occurred prior to mining. The inflow to the mine pits during mining and following mining will result in a localized drawdown of ground water surrounding the mine pits. The amount of drawdown will vary with time and distance from each pit. The maximum drawdown adjacent to the Mine pits will occur at the cessation of mining, when dewatering ceases. Recovery of the ground water levels surrounding the mine pits will occur as lake levels rise, but evaporation will preclude complete recovery. No measurable ground water level impacts are expected to occur at wells not related to the Mesquite Mine. Other than mine uses, there are no known ground water users in the subbasin. In addition, the low yields characteristic of wells completed in the subbasin (Table 3.2-1) and the poor water quality (Section 3.2.3.4) limit the potential for future beneficial uses to be developed. Due to the lack of ground water users, limitations on foreseeable beneficial uses, and localized nature of drawdown, the impact of drawdown due to the mine pits will be less than significant.

The localized lowering of the ground water table in the vicinity of the mine pits will "capture" ground water seepage from upgradient areas. Captured seepage will be pumped and used (e.g., for dust control during mining), or will evaporate from the mine pit lake surfaces, instead of seeping through the subbasin that underlies the site and ultimately recharging the Amos-Ogilby ground water basin. The short-term maximum seepage into the pits during mining may total up to a few hundred gpm. After mining in each pit ceases and a pit lake begins to form, seepage into the pit will decrease as the pit lake level rises. Mine pit evaluations indicate that on the order of 100 gpm of ground water flows through the mine pit area in the upper 300 feet of the saturated zone. If this amount of seepage were captured by the mine pits over the long term, the impact of this capture on recharge to the Amos-Ogilby ground water basin would be less than significant. As discussed in Section 3.2.3.1, the Amos-Ogilby ground water basin is recharged primarily from the Colorado River and the All-American Canal. The 100 gpm flowing through the upper 300 feet of the saturated zone in the mine pit areas represents less than 2 percent of the

recharge to the Amos-Ogilby basin. The long-term capture of ground water by the mine pits may be less because as the pit lake levels rise toward their equilibrium elevation, inflow to the pits will be reduced. In addition, the actual impact of the proposed expansion is less than quantified herein because the existing pit lakes will capture a portion of this ground water seepage over the long-term if the expansion does not occur.

4.1.2.3 Mitigation Measures

Incorporated by Regulation

The Applicant shall incorporate the following water protection features into the proposed construction, operation, and closure of the expansion as required by CCR Title 27 mining regulations administered by the RWQCB:

- Design and construct diversion and drainage facilities to accommodate precipitation conditions associated with the 100-year precipitation event.
- The heap leach pad expansion shall not be located on a Holocene Fault. (No Holocene faults exist onsite).
- The heap leach pad expansion shall be constructed with a low permeability liner system to contain process fluids.
- Containment structures shall be designed by a Registered Civil Engineer, and construction shall be supervised and certified by a Registered Civil Engineer or a Certified Engineering Geologist.
- The heap leach pad expansion shall be operated with monitoring systems to allow detection of potential process fluid leakage in the subsurface.
- The leach pad expansion shall be closed in a manner such that, after closure, it no longer poses a threat to water quality.
- The OISAs shall be closed in a manner that will minimize erosion and the threat of water quality degradation from sedimentation.
- The Applicant shall construct and operate the proposed expansion facilities in accordance with their existing State of California NPDES General Permit for Stormwater. These requirements include implementing a Stormwater Pollution Prevention Program incorporating BMPs.
- The Applicant shall mitigate impacts to Waters of the U.S. as determined by ACOE in the Section 404 process. It is anticipated that such mitigation will involve preservation of appropriate acreage of waters within the proposed compensation for desert tortoise habitat.

Incorporated Into the Project Design

The Applicant shall incorporate the following additional water protection features into the proposed mine expansion design, construction, and operation.

- Design and construct the East Rainbow and Vista diversion channels to discharge flows at approximately the same locations and flow rates that occur presently or which historically occurred prior to the development of the mine diversion system.
- Repair abnormal erosion and take steps to prevent further occurrence in a timely manner.
- Store fuels and other bulk liquids with the potential to contaminate ground water in aboveground containers within containment areas.

Incorporated to Avoid Significant Impacts

There would be no potential for significant water resources impacts after mitigations required by regulations or incorporated into the project design are implemented. Therefore, no additional mitigation measures are recommended.

4.1.2.4 Level of Significance After Mitigation Measures

With mitigation, impacts would not be significant.

4.1.3 Biological Resources

This section is based on a biological resource report prepared by Nevada Environmental Consultants Inc. (NECI) for the proposed expansion.

4.1.3.1 Assumptions and Assessment Guidelines

In order to determine the potential significance of an impact to biological resources, it is necessary to determine both the relative importance of the resource and the degree of potential project-related impact to the resource. This section identifies the factors considered in determining the importance of the biological resources that occur in the vicinity of the proposed mine expansion areas, and the significance of impact.

In order to assess the impacts on the biological environment due to the proposed mine expansion, it was assumed that extraction of materials from the proposed pit extension will be done in the same fashion as the existing mining operation using front-end loaders, shovels, and haul trucks. The excavated material will be deposited on heap leach pads. Existing haul roads will be used to the extent feasible. If any new haul roads will be constructed, they will be constructed using existing mine equipment including graders, bulldozers, and water trucks. In addition, gold processing and extraction techniques would be similar to those currently being used at the Mesquite Mine. These techniques would alter the physical characteristics of the property through the excavation of open pits, the accumulation of waste rock, and construction of heap leach pads.

General Vegetation and Wildlife Categories

Biological resources are generally considered important if they are limited in distribution, or if their ecological role is critical within a regional or local context. Plants, animals, and habitat that meet the following criteria are therefore considered to be important biological resources:

- Communities, habitats, and populations of plant and animal species that are restricted in distribution.
- Habitat that is critical to a species or a group of species for feeding, breeding, resting, and migrating.
- Biological resources that are of scientific or educational interest because they exhibit unusual physiological, social, or ecological characteristics.
- Areas that serve as core habitats and surrounding buffer zones.
- Corridors or areas that link significant resources to facilitate ecological interchange.

- Habitats supporting species listed as rare, endangered, or threatened.
- Biological resources that are declining or have economic value.

Threatened and Endangered Species

Threatened or endangered species are those species that are in danger of extinction throughout all or a significant portion of their range. Threatened or endangered species are plants and animals that are legally protected under the California Endangered Species Act (CESA) and or the federal Endangered Species Act (ESA), or other regulations. Protected species include:

- Plants and animals that are listed or proposed for listing as threatened or endangered under the ESA (50 Code of Federal Regulations (CFR) 17.11 for listed animals; 50 CFR 17.12 for listed plants; various notices in Federal Register for proposed species).
- Plants and animals that are listed, or proposed for listing, as rare, threatened or endangered under the CESA (California Department of Fish and Game (CDFG), 1991).
- Animal species that are "fully protected" in California (CDFG Code, Sections 3511, 4700, 5050, and 5515).

Special-Interest Species

Special-interest plants and animals are those species that are vulnerable and recognized as rare (sometimes known as "sensitive") by scientists, conservationists, or agencies, and are therefore, afforded special consideration under the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA). Vulnerability may be due to limited distribution of a species, rarity throughout a wide distribution, particular sensitivity to environmental effects, or a combination of these and other factors.

Special-interest plant or animal species include:

- BLM Sensitive Species. The BLM maintains a list of "sensitive species" which generally includes federal Category 1 and 2 species, as well as other protected species (such as the state protected bighorn sheep).
- Plants occurring on Lists 1A, 1B, 2, 3, and 4 of the *California Native Plant Society's Inventory of Rare and Endangered Vascular Plants of California* (Smith and Berg, 1988).
- Animals designated "Species of Special Concern" by the CDFG and listed on the Natural Diversity Data Base (NDDB) (Remsen, 1978; Williams, 1986; CNDDB, 1991).
- Game species, are considered here as special-interest species because of their economic and recreational value.

4.1.3.2 Thresholds of Significance

Based upon NEPA and CEQA guidelines and commonly accepted criteria, an impact would be determined significant if it could:

- Substantially diminish habitat for a plant or animal species.
- Substantially affect a threatened, or endangered, species, special-interest species, or its habitat.
- Interfere substantially with the movement of a resident or migratory wildlife species.

The significance of potential impacts to vegetation and wildlife are evaluated based upon sensitivity of the resource and the extent of the impact. Highly sensitive resources (such as a threatened or endangered species) may be able to absorb only a limited degree of impact. Conversely, resources determined to have a low sensitivity (e.g., common or widely distributed species, or species that may be declining elsewhere but have a large, locally stable population) may be able to sustain a relatively large impact or population loss and not be significantly affected.

"Incidental take" refers to takings that result from, but are not the purpose of, carrying out an otherwise lawful activity conducted by a federal agency or applicant (50 CFR §402.02). Some impacts associated with large construction projects can be considered incidental takings. Take is defined as an action that would "harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct" (16 U.S.C. §1538 [1973]). Take has also been defined through case law as an adverse modification of habitat. Habitats falling within any of the three categories for desert tortoise (*Gopherus agassizii*) management as defined by BLM are considered important resources. Impacts to tortoises and their habitat are evaluated according to the above criteria. Incidental take of federally threatened or endangered species is authorized by the Secretary of the Interior through the Section 7 consultation process.

Biological impacts are not considered significant if the resource is not considered important or sensitive according to the above criteria, or if the extent of impact on the species or its habitat is limited.

4.1.3.3 Impacts of the Proposed Action

The proposed mine expansion is located immediately adjacent to an area that has been heavily affected by mining activities from the existing Mesquite Mine. As detailed in Table 2.1-1, proposed modified facilities comprise approximately 693 acres. Of this, 171 acres were previously disturbed by prior ancillary activities, leaving a balance of 522 acres. However, only 189 acres of this are unpermitted, while 421 acres comprise uncompensated desert tortoise habitat. The impacts of these expansions are considered in the discussion of on-site impacts.

Vegetation

The three native plant communities in the project area, desert microphyll woodland, upland succulent and creosote bush scrub, are the habitat types that would be directly impacted (see Figure 3.3-1). The proposed expansion would result in a direct loss of approximately 380 acres of cresosote/desert pavement habitat, approximately 67 acres of microphyll woodland habitat, and approximately 45 acres of upland succulent habitat. Another 15 acres of microphyll woodland would be cut off from upstream water sources south of the proposed North Diversion Channel. Blue palo verde (*Cercidium floridum*) and desert ironwood (*Olneya tesota*), associated with these three plant communities would also be impacted. Suitable habitat for ribbed cryptantha and winged cryptantha was observed throughout the proposed project area, though no individuals for these species were observed. Of these three habitat communities, microphyll woodland is considered the most sensitive because it provides potential habitat for several sensitive bird, reptile and mammal species.

Based on the revegetation approach described in Sec. 2.1.7 that utilizes no supplemental irrigation except for transplanted trees or shrubs, no significant problem with growth of invasive exotic plant species in reclaimed areas is anticipated. It is possible that tamarisk trees may persist for some time in areas having high moisture. If this occurs, selective spraying of the tamarisks with an approved herbicide such as Roundup and/or Garlon will be considered, if necessary, subject all applicable regulations and to BLM approval.

Microphyll Woodland

To characterize impacts to this habitat, microphyll woodland was defined as the consisting of one or more individuals of desert ironwood, blue palo verde, and or smoke tree spaced within 100 meters of each other. Within the areas proposed for mine expansion, a total of approximately 82 acres of microphyll woodland are present.

Of the approximately 82 acres of proposed impact to microphyll woodland, approximately 23 acres (heap leach pad expansion, Section 16) are already permitted and compensated for in accordance with previous environmental mitigation. Therefore, the proposed action will result in a net impact of approximately 59 acres of microphyll woodland (44 acres direct impact, 15 acres indirect). Impacts to this 59 acres of microphyll woodland habitat would be significant. Table 4.1.3-1 shows impacts to microphyll woodland for each proposed expansion areas.

Microphyll woodland is considered by CDFG to be one indicator of CDFG jurisdictional streambeds under Section 1600 of the Fish and Game Code. The other indicator on-site is desert washes, which are considered jurisdictional waters by the U. S. Army Corps of Engineers (See Section 3.2, Water). The total area of CDFG jurisdictional streambeds (microphyll woodland + desert washes – overlap) within the unpermitted expansion areas is approximately 25.36 acres while there are approximately 39.92 acres in areas previously permitted for Mine disturbance. Figure 4.1.2-3 shows the proposed Plan of Operations boundary and mapped microphyll woodland areas and Waters of the U.S. Table 4.1.3-2 details CDFG jurisdictional components by expansion area.

Table 4.1.3-1
Proposed Action Impacts to Microphyll Woodland, by Expansion Area

Proposed Expansion Area	Impacts to Microphyll Woodland (Acres)	
	Direct	**Indirect**
North Extension (unpermitted)	8 acres	0acres
North Drainage Diversion	7acres	*15 acres cut off from upstream water due to diversion
East Rainbow North Overburden/Interburden		
Previously Permitted by BLM/Imperial Co.	1 acres	0
Not Permitted	0 acres	0
Total	1 acres	0
East Rainbow Drainage Diversion		
Previously Permitted by BLM/Imperial Co.	6 acres	0
Not Permitted	1 acres	0
Total	7 acres	0
East Rainbow Extension		
Previously Permitted by BLM/Imperial Co.	5 acres	0
Not Permitted	4 acres	0
Total	9 acres	0
East Rainbow South Overburden/Interburden		
Previously Permitted by BLM/Imperial Co.	12 acres	0
Not Permitted	0 acres	0
Total	12 acres	0
Leach Expansion (Previously Permitted by BLM/Imperial Co.	23 acres (a)	0
Total Impacts, by type	**67 acres**	**15 acres**
Total Direct and Indirect Impacts	**82 acres**	
Acreage not compensated for, by type	44 acres	15 acres
Total acreage not previously compensated for	**59 acres**	
Acreage requiring mitigation per BLM (b)	20 acres	15 acres
Total acreage requiring mitigation, per BLM	**35 acres**	

Source: NECI, 2000

Notes: All values rounded to nearest integer.

(a) All of Section 16 was permitted, and impacts were compensated.

(b) BLM has determined that only impacts to microphyll woodland that were not previously permitted will be required to be mitigated.

Table 4.1.3-2
Waters of the U.S. and Microphyll Woodland, in Acres, by Expansion Area, Proposed Action, Mesquite Mine Expansion

Proposed Action	Waters of U.S.		Microphyll Woodland		Overlap (a)		Total CDFG Jurisdiction (b)	
Expansion Area	Prev. Permitted	Not Permitted	Prev. Permitted	Not Permitted	Prev. Permitted	Not Permitted	Prev. Permitted	Not Permitted
North Exten. Big Chief Pit	0	1.84	0	8	0	1.68	0	8.14
Big Chief Pit S/SE Exten. (c)	0	0	0	0	0	0	0	0
East Rainbow Pit Extension	3.68	0.7	5	4	0.02	0.08	8.66	4.62
Big Chief West OISA	0	0	0	0	0	0	0	0
East Rainbow North OISA	1.7 (d)	0	1	0	0	0	2.7	0
East Rainbow South OISA	8.25	3.48 (d)	12	0	0	0	20.25	3.48
E. Rainbow Diversion Channel	2.3	0.24	6	1	0.04	0.04	8.26	1.2
North Extension Diversion Channel	0	2.78	0	7	0	2	0	7.78
Heap Leach Pad No. 6 Expansion (e)	NA	NA	NA	NA	NA	NA	NA	NA
TOTALS	**15.93**	**9.04**	**24**	**20**	**0.06**	**3.8**	**39.87**	**25.24**
TOTALS	**24.97**		**44**		**3.86**		**65.11**	

Source: Jones & Stokes, 1999 and 2000; NECI, 2000; BRG Consulting, 2000

(a) Areas where microphyll woodland is found in drainages meeting ACOE definitions for jurisdictional waters

(b) The sum of estimated acres of waters of the U.S. plus microphyll woodland acres, less the area of overlap.

(c) The area was previously disturbed by ancillary mining activities.

(d) Extrapolated by BRG from Jones & Stokes data.

(e) All of Section 16 was previously permitted for heap leach pad disturbance, and compensated.

The vegetated areas that would be disturbed by the project represent a very small percentage of similar vegetation communities that occur in the project vicinity and in the Colorado Desert as a whole. As such, the project area is not considered a significant portion of the available plant community. Undisturbed adjacent areas throughout the region provide similar habitat for plant species. Because the proposed project would be located in plant communities that are widely distributed, it would not significantly reduce the overall species diversity or population of any plant species within the Colorado Desert.

Blue palo verde and desert ironwood would also incur impacts from the Proposed Action. These plants are classified as regulated state plants and are protected by state law. However, this law was designed to regulate harvest of plants for nursery and other purposes and does not apply to land clearing or other development activities. Individual plants that are suitable for transplantation will be removed and transplanted prior to surface disturbance activities, as described in Section 2.1.7. Therefore, impacts would not be significant.

Based upon the types of vegetation communities and species represented, and the location of the project site in the context of the Colorado Desert, proposed activities at the mine would not result in significant impacts to: (1) vegetative communities restricted in distribution, (2) core habitats, or (3) buffer zones. However, the loss of 59 acres (net) of microphyll woodland from the proposed expansion would reduce available habitat for protected or sensitive desert species, most notably resident and migrant bird species and mule deer.

Wildlife

Construction would affect the habitat of many common species of desert animals that are found in this region, as well as a few sensitive or protected species that use the area. Resident reptiles, including the desert tortoise, would be displaced from the site. On-site habitat would be lost or reduced for resident birds. Microphyll woodland habitat (59 acres) used by wintering and migrating birds for cover, forage, and nesting sites would be lost or reduced. The loss of habitat for migrant birds in the lower Colorado River Valley has created a need to maintain peripheral habitats for bird breeding and wintering. The habitat in the project area is a small part of a large but lesser-quality, bird-breeding and wintering habitat resource provided by the Colorado Desert. Because vegetation in the project area is sparse, and the surrounding area is virtually undeveloped and has similar habitat, the loss of 59 acres of microphyll woodland habitat as a bird-breeding and wintering area would not be considered a significant impact.

Mammals, such as the mule deer (*Odocoileus hemionus*) visit the site to browse. The proposed mine expansion would decrease available foraging area for these mammal species on a regional basis. However, the surrounding area is virtually undeveloped and would not be affected by the proposed mine expansion. Therefore, there would be no overall effect on the ecological systems that support mammals that are indigenous to the area and impacts would not be significant. Smaller mammals, reptiles, and amphibians (i.e. wildlife with small home ranges and reduced mobility) would be affected the most due to their inability to relocate off site. Because these species are regionally abundant, their displacement would not significantly impact the regional ecosystem.

Equipment operation and human presence would be expected to further affect wildlife. Direct mortality could occur to resident animals in burrows or nests destroyed by heavy equipment. Animals that would move (or be moved) off the site could indirectly affect animals in adjoining habitat by inducing temporary population stress. Daily operations could impact species sensitive to high noise levels. Noise and the presence of humans associated with project operations may discourage the presence of the larger mammals such as the mule deer and bighorn sheep, as well as the larger predators such as the coyote (*Canis latrans*).

Surface disturbances and habitat loss as a result of project construction would not be expected to significantly affect wildlife populations due to the availability of adjacent large habitat areas. In addition, compensation lands primarily provided to offset loss of desert tortoise habitat, would also benefit other species.

The proposed expansion would not be expected to significantly interrupt wildlife movement patterns or result in additional habitat fragmentation (the local habitat is already fragmented by the existing Mesquite Mine and SR 78) because wildlife would be able to move around the proposed project area to get to the other side. The project site is not known to provide significant habitat for animal species of restricted distribution, or to provide core habitat for any species. Impacts would not be significant.

Ecological Risk Assessment

An ecological risk assessment was conducted by Samuel Bamberg and Shepherd-Miller, Inc. (2000) relative to current and predicted future pit lake water quality at the Mesquite Mine site. The two proposed alternatives examined were that of open pits (the Proposed Project/Action or Reduced Footprint Alternative) or that of total backfill, where all the new overburden/interburden would be placed in the pits (the IOISA Option Alternative). Potential risks were evaluated only for those resident or migratory species (receptors) that would be present at the site, in the absence of mining activities. Aquatic invertebrates and wetland plants were excluded from the study because they would only exist at the site because of the presence of the pit lakes. Six receptors were studied: plant-feeding waterfowl, invertebrate-feeding waterfowl, raptors, mice, rabbits, deer and coyotes. These six receptors provide coverage of site species and major food chains that could potentially be affected by the presence of the pit lakes.

For each receptor, the study evaluated both drinking water and dietary ingestion pathways. Pit lake water quality data from 1997-1999 was used to calculate acute and chronic levels of each chemical of concern (COC) for initial (current) conditions for drinking water intake for each receptor species. The study used predicted water quality data to evaluate future ecological risks through the drinking water pathway.

The aquatic dietary pathway follows transfer of COCs from water through algae and invertebrates to waterfowl. The terrestrial dietary pathway evaluates transfer of COCs from the pit lake water through vegetation to herbivores and carnivores. Risks through the dietary pathway under current conditions were not evaluated because there has been only minimal development of the aquatic and

terrestrial communities, and these will probably be short-lived until mining activities are completed. In addition, the development and extent of these communities will be highly dependent on the final pit configuration. If the final water elevations intersect steep pit walls, very little development of plant communities along the shorelines would be expected. The presence or absence of substantial vegetation communities affects both the potential transfer of COCs in food chains, as well as providing or limiting available habitat for site herbivores. In the study, the authors developed conceptual models of potential development of aquatic and terrestrial communities under post-mining conditions. These communities were then used as the basis for the risk assessment through dietary pathways.

Safe dietary concentration and bioconcentration factor (BCF) values were obtained from the literature on this topic, and used to back-calculate safe water concentrations in the pit lakes, for both open pit and partial backfill alternatives. These safe water concentrations were then compared to predicted concentrations to determine if there was the potential for significant risk to any of the receptor species. A conservative approach was use in selection of these values in order to provide an additional measure of safety in the overall assessment.

The study concluded that currently there is no significant risk to site receptors from the drinking water pathway and existing water quality. However, four COCs present the potential for significant ecological risks to migratory and resident animal populations under predicted future water quality conditions. These four COCs are boron, fluoride, selenium and silver. Although all four present significant ecological risk potential under both open pit and partial backfill alternatives, the risks associated with the partial backfill option are much greater. A further discussion of the risks posed by these four COCs in the drinking water and dietary pathways is provided below.

Drinking Water Pathway

- The predicted future concentrations of boron in both the open pit and total backfill options indicate a potential risk to birds, deer and coyote receptors. This conclusion is based upon the exceedance of the literature-derived safe level of 5 ppm. However, none of the predicted concentrations exceed the safe drinking water values listed by Oak Ridge National Laboratory (ORNL), suggesting that the overall risk is likely low.

- The predicted future selenium concentrations in the Big Chief South pit lake, under the total backfill option, slightly exceeds the safe drinking water level for birds and mammals. No other exceedances of safe levels under either option was predicted.

- Predicted future silver concentrations only exceed the safe drinking water level for birds and mammals under the partial backfill option (at Big Chief South pit lake).

- Predicted concentrations of fluoride in many of the pit lakes under the partial backfill option exceed the literature-based safe drinking water level. However, all of the predicted

concentrations are well below the concentrations listed by ORNL as safe for birds and mammals, suggesting that the risk from fluoride in drinking water is likely low.

- Increasing salinity of pit lake waters as a result of evaporation will likely preclude significant use of these lakes as drinking water sources due to their water's unpalatability.

Dietary Exposure Pathway

- Under the open pit option, deer and coyotes might be at risk from boron transfer through dietary food chains. Under the partial backfill option, mice, rabbits, deer, coyotes, and raptors have a risk potential from dietary boron exposure.

- Predicted selenium levels in pit lake water under both the open pit and partial backfill options are likely to present a risk to mice, rabbits and deer through dietary exposure. Coyotes are potentially at risk under the partial backfill option, but not for the open pit option. Similarly, the open pit option is unlikely to present a risk to waterfowl or raptors, though the potential for risk increases substantially under the partial backfill option for these receptors.

- Predicted silver concentrations in the pit lakes presents a potential dietary risk to raptors, mice, rabbits and deer under both options. Waterfowl that consume invertebrates under the partial backfill option may also be at risk. Predicted risk from dietary exposure to silver, however, is based on limited literature regarding safe levels and transfer factors. Furthermore, silver has not been detected in the pit lakes or groundwater, so the predicted future concentrations are quite uncertain because they are based on 50% of the current non-detect values.

- Predicted fluoride concentrations in the pit lakes do not represent a risk to waterfowl or raptors under either option. However, deer and coyotes have potential dietary risk associated with fluoride under both mine options, whereas mice and rabbits are only at risk under partial backfill.

In summary, four COCs (boron, selenium, silver and fluoride) present potential future risk to site receptors from the drinking water exposure pathway, particularly with the total backfill option. However, due to predicted high salinity of the lakes as a result of evaporation, only limited use of the waters for drinking is expected. The more critical potential exposure pathway is through dietary exposure from vegetation that could colonize the edges of the lakes.

Since the principal route of exposure and potential risk to site biota is through the dietary pathway, limiting the development of vegetation within the pit lake basins would minimize the potential for risk, since it would largely preclude uptake of COCs into vegetation, and thus the subsequent transfers to site receptors. In addition, preventing the development of any substantial vegetation communities along the pit lake edges would also reduce the available habitat for terrestrial biota, further limiting the risk potential. An effective mitigation of potential risk could be accomplished

by constructing the pits such that the pit walls at, immediately above, and immediately below the permanent water line are too steep to allow for successful colonization of plants.

Threatened and Endangered Species

This section discusses impacts to the desert tortoise, the only federal or state listed endangered or threatened wildlife species observed or expected to occur on-site. There are no federal or state listed endangered or threatened plant species observed or expected to occur on-site.

Desert Tortoise (USFWS: Threatened; CDFG: Threatened; BLM Sensitive Species)

Desert tortoise surveys were conducted on April 14-16, 1999 and June 1, 2000 within all of the proposed expansion areas (See Section 3.3). Based on the field surveys, a total of 4 tortoises, 8 pallets and 59 burrows were observed throughout the proposed expansion areas (See Figure 3.3-2).

Another survey was conducted on April 16 and September 2, 1999 along SR 78, where it runs adjacent to and parallel with the mine property line, found no signs of tortoises, either individuals or signs of burrowing under the fence. The majority of the fence has a protective berm of soil heaped along the inside, which appears to serve as a deterrent to burrowing. Also, no sensitive plant species were observed during the survey. During the interim months, no signs of tortoise fatalities or activity were observed along this section of SR 78 by NECI or Mesquite Mine personnel. However, an adult tortoise has been repeatedly sighted by mine personnel in the area of the proposed North Extension. This individual was not observed during the tortoise surveys but may still be utilizing this area as part of its home range.

Approximately 693 acres of desert tortoise habitat (BLM Category II and III) will be disturbed as a result of the proposed expansion. The loss of this 693 acres of potential habitat from the proposed mine expansion would represent a significant direct impact on the desert tortoise. However, approximately 272 acres are currently compensated for, or were disturbed prior to the listing of the desert tortoise. All of the acres in Section 16 are permitted and have been compensated for under Biological Opinion (1-6-92-F-22). Therefore all of the acreage in Section 16 have already been compensated for and no additional impacts are anticipated. A total of 421.6 acres of impacts to tortoise have not been compensated, and would be new impacts associated with implementation of the Proposed Project/Action. Biologists from NECI conducted tortoise surveys on all of the proposed expansion areas utilizing methodologies currently acceptable to USFWS. The results of the Tortoise Surveys of April 14 -16, 1999 and June 1, 2000 are found in the NECI Biological Report (2000).

Impacts to desert tortoises and desert tortoise habitat on the property are considered to be low since population density is low; however, some "take" may occur from the loss of potential habitat. Because the desert tortoise is a Federally threatened, as well as state listed species, any potential take would require consultation with USFWS under Section 7 of the Federal Endangered Species Act, and contact with CDFG under CESA.

Mitigation measures typically require relocating desert tortoises inhabiting impact zones. Secondary impacts to the relocated tortoises could occur as a result of potential stresses associated with relocation (mostly, but not limited to, lack of knowledge of cover sites, nest sites, and foraging areas). Established tortoises in the recipient population could potentially be affected by competition for foraging land and increased antagonistic social interactions. The degree to which these factors would occur and affect the success of relocation are not well understood. Impacts would also include temporary disruption of the vertebrate community structure, including predator/prey relationships, adjacent to the site.

The project design incorporates several mitigation measures designed to reduce impacts to the tortoise. Specific mitigation measures to be utilized will be determined as part of the Section 7 consultation process. While some impacts (such as habitat loss) would be unavoidable at the site, the established mitigation measure of compensating for such habitat loss through the acquisition and transfer to federal ownership of higher quality habitat would be implemented. The level of such habitat compensation would be determined by the BLM in consultation with the USFWS . For the mine expansion to be constructed, these agencies would have to be satisfied that the mitigation measures for the tortoise were adequate so as to prevent the project from jeopardizing the continued existence of the tortoise.

Other Special-Interest Species

Species recognized as sensitive by scientists, conservationists or agencies do occur on or near the project site. As described above, special-interest plant or animal species include: animals designated as "Species of Concern" by the USFWS (FSOC); BLM Sensitive Species (BLM SS); plants occurring on Lists 1A, 1B, 2, 3, and 4 of the *California Native Plant Society's Inventory of Rare and Endangered Vascular Plants of California (CNPS);* animals designated as "Species of Concern" (CSOC) or "Species of Special Concern" (CSOSC) by the CDFG and listed on the Natural Diversity Data Base (NDDB); and, California game species (CGS), because of their economic and recreational value.

Plants

Fairy Duster CDFG NDDB; CNPS #2

The fairy duster *(Calliandra eriophylla)* was found on three of the proposed expansion areas totaling approximately 223 acres. Fewer than 20 individuals were found in the proposed "East Rainbow North Overburden/Interburden Area." In addition, 5-10 individuals were observed within the proposed "East Rainbow Extension", and fewer than 23 individuals were observed within the proposed "Leach Expansion Area". Impacts to fairy dusters in the proposed expansion areas would be significant.

Slender-lobed 4 O'clock flower; CNPS#4

No individuals of slender-lobed 4 o'clock flower *(Mirabilis tenuiloba)* were observed during the survey period. However, suitable habitat does exist within the proposed "East Rainbow South Overburden/Interburden Area" in the large sandy wash that follows the base of the existing waste piles

(approximately 10 acres). The loss of potential habitat for this species from the proposed mine expansion would be significant.

Winged Cryptantha; CNPS#4

No individuals of winged cryptantha *(Cryptantha holoptera)* were observed during the survey period. However, suitable habitat was observed throughout the proposed project area. The loss of potential habitat for this species from the proposed mine expansion would be significant.

Ribbed Cryptantha; CNPS#4

No individuals of ribbed cryptantha *(Cryptantha costata)* for this species were observed during the survey period. However, suitable habitat was observed throughout the proposed project area. The loss of potential habitat for this species from the proposed mine expansion would be significant.

Mammals

Mule Deer; CGS

Scat and tracks from mule deer *(Odocoileus hemionus)* were observed within all of the washes in the proposed project area. Approximately 59 acres (net) acres of microphyll woodland will be disturbed as a result of the proposed expansion. However, the proposed expansion areas do not contain any unique or abundant resources as compared to adjacent lands. The development of the proposed mine expansion would decrease available foraging area on a regional basis. However, the surrounding area is virtually undeveloped and would not be affected by the proposed mine expansion. Therefore, there would be no overall effect on the ecological systems that support mule deer and impacts would not be significant.

Animals may be attracted to uncovered water sources and attempt to drink, particularly during the hot, dry months of summer. However, during mine operations there is no open water that may attract wildlife. All solution ponds and channels are covered. No water is allowed to accumulate in the mine pits – that would interfere with the mining operation. An uncovered and dry "overflow pond" is part of the mine facilities, designed to capture runoff from precipitation events that exceed the 100-year storm. Such events are by definition rare, and animals would have alternative water sources available if such an event occurred. Therefore, there is no impact. Possible impacts associated with mine lakes following completion of mining are addressed in the ecological risk assessment, by Bamberg and Shepherd-Miller, Inc. (2000).

Bighorn Sheep; BLM Sensitive Species; CDFG Game Species

Bighorn sheep (*Ovis canadensis*) have not been observed within the area of the mine but have been observed in the vicinity. Approximately 59 acres (net) acres of microphyll woodland will be disturbed by the proposed expansion. However, the proposed expansion areas do not contain any unique or abundant resources as compared to adjacent lands. The development of the proposed mine expansion would decrease available foraging area on a regional basis. However, the surrounding area is virtually undeveloped and would not be affected by the proposed mine expansion. In addition, no

individuals or sign were observed on the proposed expansion areas and no bighorn sheep have been observed on the property by mine personnel since mining started in 1984. Therefore, there would be no overall effect on the ecological systems that support bighorn sheep and impacts would not be significant.

Bat Species

Suitable roosting habitat was not present within any of the proposed expansion areas, however all of the areas are considered to be suitable as foraging habitat. Three known/potential roosting sites were identified in the region.

There is microphyll woodland between bat-occupied mines and Mesquite Mine, and these woodlands are probably used more heavily than the woodlands on the Mesquite Mine property. According to Dr. Brown-Berry (personal communication 8/16/99) the bats would use a closer source of food than a further one to save energy and time.

California Leaf-Nosed Bat; FSOC/CSOC/BLM SS

The entire project area was identified as potential foraging habitat for the California leaf-nosed bat (*Macrotus californicus*). Only one known roost site for this species occurs within three miles of the Mesquite Mine. There is microphyll woodland between bat-occupied mines and Mesquite Mine, and these woodlands are probably used more heavily than the woodlands on the Mesquite Mine property. According to Dr. Brown-Berry (Personal Communication, 1999) the bats would use a closer source of food than a further one to save energy and time. Therefore, development of the proposed mine expansion would not have a significant impact on the California leaf-nosed bat.

Greater Western Mastiff Bat; BLM SS

The entire project area was identified as potential foraging habitat for the greater western mastiff bat (*Eumops perotis*). There are no known roosting sites for this species in the vicinity of the Mesquite Mine. Therefore, development of the proposed mine expansion would not have a significant impact on the greater western mastiff bat.

Southwestern Cave Myotis; BLM SS

The entire project area was identified as potential foraging habitat for the southwestern cave myotis (*Myotis velifer brevis*). There are no known roosting sites for this species in the vicinity of the Mesquite Mine. Therefore, development of the proposed mine expansion would not have a significant impact on the southwestern cave myotis.

Small-footed Myotis; BLM SS/ FSOC

The entire project area was identified as potential foraging habitat for the small-footed myotis (*Myotis ciliolabrum*). There are no known roosting sites for this species in the vicinity of the Mesquite Mine. Therefore, development of the proposed mine expansion would not have a significant impact on the small-footed myotis.

Desert Pallid Bat; CSOSC/BLM SS

The entire project area was identified as potential foraging habitat for the desert pallid bat (*Antrozous pallidus pallidus*). Pallid bats are known to occur in small roosts of 10-20 individuals in natural caves and crevices. There are two known roosts of pallid bats located within 6 miles of Mesquite Mine. Other possible roosts, if they exist in the adjacent mountains near the mine, could incur impacts from loss of microphyll woodland foraging areas. However, significant impacts to pallid bats from the proposed mine expansion is considered unlikely, due to 1) the wide range of pallid bats (British Columbia to central Mexico) and 2) pallid bat versatility in roosting site choices, and ability to relocate their roosts. Therefore, development of the proposed mine expansion would not have a significant impact on the desert pallid bat.

Spotted Bat; FSOC/CSOC/ BLM SS

The entire project area was identified as potential foraging habitat for the spotted bat(*Euderma maculatum*). Known roosting sites for the spotted bat in the vicinity of the Mesquite Mine area are more than two miles away. Therefore, development of the proposed mine expansion would not have a significant impact on the spotted bat.

Townsend's Big-Eared Bat; CSOC

Townsend's big-eared bat (*Corynorhinus townsendii*) is a medium-size bat with buffy-brown fur distinguished by two-pronged, horseshoe-shaped lumps on the rostrum. These bats occur in a wide range of habitats in deserts. They prefer cave-like roosting habitat. Population concentrations occur in areas having substantial surface exposure of cavity-forming rock, such as limestone, sandstone, gypsum, or volcanics. This species also uses old mining districts and buildings having cave-like features. Maternity colonies vary from a dozen to several hundred animals. Their diet is primarily lepidopteran, usually medium-sized moths. The proximity of good foraging habitat appears to be a determining factor in roost selection. They usually forage within three miles of their roosts. This species is known from one roost in the Chocolate Mountains. Suitable foraging habitat for this bat is present within the proposed expansion areas. However, no known roosts are located in close proximity to Mesquite Mine. Therefore, development of the proposed mine expansion would not have a significant impact upon Townsend's big-eared bat.

Birds

Avian species of special concern are also known to occur on-site or in the project area. These species include Le Conte's thrasher, the burrowing owl and the prairie falcon. The loss of 522 acres of habitat (190 acres unpermitted) for these species would not be significant given the availability of large-quantities of similar habitat in the Colorado Desert and the exchange and compensation that would occur to obtain use of the on-site BLM-managed lands.

Burrowing Owl; CSOSC

Suitable habitat for the burrowing owl (*Athene cunicularia*) is present within the proposed expansion areas. However, no individuals or burrows were observed within the proposed expansion areas. Based on the fact that the habitat found within the proposed expansion areas does not exhibit any unique characteristics and is a small percentage of the available habitat surrounding the Mesquite Mine, no significant impacts to burrowing owls are anticipated.

LaConte's Thrasher; CSOSC

Surveys for LeConte's thrasher (*Toxostoma lecontei*) were conducted on April 10th, 13th and 16th 1999 along the proposed East Rainbow Extension (See NECI Biological Report, 2000). The washes within the proposed project area were only marginally suitable for LeConte's thrasher (*Toxostoma lecontei*). Only marginal habitat was identified along the northeast portion of the mine expansion, and no individuals were observed during the field surveys. No impacts to LaConte's thrasher are expected.

Prairie Falcon; CSOC

The entire project area was identified as potential foraging habitat for the Prairie Falcon (*Falco mexicanus*) because there are nests in the Chocolate Mountains. These nests or aeries are less then 50 miles away, putting the mine within the known foraging range of nesting pairs. However, no potential roost sites were observed within the proposed expansion areas. Impacts to this species would be less than significant.

Amphibians

Couch's Spadefoot Toad; FSOC/CSOS/ BLM SS

A population of Couch's spadefoot toad *(Scaphiopus couchii)* lives in an area adjacent to the Algodones Dunes and along SR 78. The Couch's spadefoot toad was not observed within the proposed expansion areas. During surveys for tortoise and thrashers (April 12-16, 1999) no areas exhibiting characteristics associated with pooling or ponding of water for 7 to 10 days were observed in the proposed expansion areas. Characteristics evaluated included soil staining, build up of organic material, and desiccation cracks in soil within depressions along the washes. In addition, working mine areas would be bermed to prevent surface flows from increasing downstream sediment flows. For these reasons, impacts to the referenced Couch's spadefoot toad population at the Algodones Dunes would not be significant.

Reptiles

Western Chuckwalla; FSOC/BLM SS

Less than 3 acres of habitat for the western chuckwalla *(Sauromalus obesus)* was observed within the proposed "North Extension" and the proposed East Rainbow North Overburden/Interburden Extension" area. No individuals were observed during the survey but, based on past observations of

chuckwalla in the vicinity, it is possible that a population exists within the proposed project area. Impacts to this species would not be significant, based on the thousands of acres of such habitat that is available in the general vicinity of the Proposed Project.

Proposed Expansion Areas

Table 4.1.3-3 qualitatively summarizes impacts for each proposed expansion area. Both significant and non-significant impacts prior to mitigation are included in this table. However, all impacts are mitigated to a level less than significant as a result of the proposed mitigation measures, discussed in Section 4.1.3.4.

4.1.3.4 Mitigation Measures

This section presents mitigation measures for plant and animal communities within the Proposed Action area of influence. Special emphasis is placed on species listed as threatened or endangered, having the potential to be affected by the Proposed Action. The primary species of concern that would be affected by the Proposed Action is the desert tortoise. Mitigation for this and others potentially affected sensitive species are described in this section.

During the life of the project, the construction, maintenance, and other activities that have the potential to impact sensitive species will undergo environmental review by a qualified biologist and appropriate agencies. Through mitigation monitoring, the effectiveness of mitigation measures shall be evaluated throughout the life of the facility and may be modified, based on new information and/or new technology. Significant changes to project design, or activities that may affect a listed species and which effects were not considered during the Section 7 consultation, will require re-initiation of applicable Endangered Species Act consultation. Additionally, if new information becomes available on listed species or impacts to listed species, or if the incidental take limit is exceeded, re-initiation of applicable Endangered Species Act consultation will also be required.

The mitigation measures presented in this section include those utilized for other similar actions at the Mesquite Mine in the past. These measures were derived from a Biological Opinion (1-6-98-F-39) on the "Proposed Mesquite Mine Exploratory Drilling Project, Imperial County, California" (July 7, 1998); a Biological Opinion (1-6-97-F-34) titled "The Proposed Gunnery Range Land Exchange, Chocolate Mountains, Imperial County, California"(April 14, 1997); a Biological Opinion (1-6-92-F-28) for "Small Mining and Exploration Operations in the California Desert" (June 1, 1992); and a Biological Opinion (1-6-92-F-22) for the "Continued Operations of Gold Fields Operating Company's Mesquite Mine" (March 26, 1992).

General Mitigation Measures

1. At the end of the project, disturbed areas, including new access roads, should be re-contoured and re-seeded with an appropriate mixture of native plant species according to the Reclamation Plan. All desert tortoise-proof fences should be removed also according to the Reclamation Plan.

Table 4.1.3-3
Summary of Proposed Action Biological Impacts By Proposed Expansion Area

Proposed Expansion Area	Vegetation Impacts	Wildlife Impacts
North Extension Area Big Chief	Loss of habitat for ribbed cryptantha, and winged cryptantha,	Loss of habitat for desert tortoise, western chuckwalla (ns), bighorn sheep (ns), and foraging habitat for the prairie falcon (ns).
North Drainage Diversion	Loss of habitat for the fairy duster, ribbed cryptantha, winged cryptantha,	Loss of habitat for desert tortoise, mule deer (ns), bighorn sheep (ns), burrowing owl (ns), and foraging habitat for the prairie falcon (ns).
Big Chief West OISA	Loss of habitat for the ribbed cryptantha and winged cryptantha	Loss of habitat for desert tortoise and western chuckwalla (ns), and foraging habitat for the prairie falcon (ns).
East Rainbow North OISA (previously permitted)	Loss > 20 individuals of fairy duster Loss of habitat for the ribbed cryptantha and winged cryptantha	Loss of habitat for desert tortoise, mule deer (ns), bighorn sheep (ns), burrowing owl (ns), and foraging habitat for the prairie falcon (ns).
East Drainage Diversion	Loss of habitat for the fairy duster, ribbed cryptantha and winged cryptantha,	Displacement of one desert tortoise. Loss of habitat for the desert tortoise, mule deer (ns), bighorn sheep (ns), burrowing owl (ns), and foraging habitat for the prairie falcon (ns).
East Rainbow Extension	Loss of approximately 5-10 individuals of fairy duster Loss of habitat for the ribbed cryptantha and winged cryptantha	Displacement of one desert tortoise. Loss of habitat for the desert tortoise, mule deer (ns), bighorn sheep (ns), burrowing owl (ns), and foraging habitat for the prairie falcon (ns).
East Rainbow South OISA	Loss of habitat for the fairy duster, ribbed cryptantha, winged cryptantha, and slender lobed 4 o'clock flower,	Displacement of one desert tortoise. Loss of habitat for the desert tortoise, mule deer (ns), bighorn sheep (ns), burrowing owl (ns), and foraging habitat for the prairie falcon (ns).
Leach Expansion (previously permitted and compensated)	Loss of > 23 individuals of fairy duster Loss of habitat for the ribbed cryptantha and winged cryptantha	Displacement of one desert tortoise. Loss of habitat for desert tortoise, mule deer (ns), bighorn sheep (ns), burrowing owl (ns), and foraging habitat for the prairie falcon (ns).

Source: NECI (ns) = impact less than significant

2. Access should be confined to approved routes to reduce impacts brought about by road proliferation.

3. All bladed vegetation and excavated materials should be stockpiled in such a manner that they do not obstruct the natural flow of water down wash systems.

4. Destruction of vegetation, particularly cacti and patches of herbaceous plants, shall be avoided whenever possible.

5. All compacted soil (except desert pavement) shall be scarified upon completion of mining activities. This may be done by using rippers, discs, rakes or other appropriate equipment.

6. Storage of equipment, supply material, ores or any residue of the mining operation shall be accomplished in a manner, which minimizes surface disturbance.As identified in the Revised POO, and to the extent practicable, all pits should be backfilled.

7. Impacts to CDFG jurisdictional streambed shall be mitigated at a 3:1 ratio, in accordance with permits issued by CDFG under Section 1600 et seq. of the Fish and Game Code.

8. Impacts to waters of the U.S., and associated microphyll woodland habitat, will be mitigated through 1) preservation of at least 3 times the acreage of such habitat (3:1 mitigation ratio) within the desert tortoise compensation area described below, and 2) through revegetation of microphyll woodland habitat along 3.8 miles of drainage diversions within the mine. The actual amount of waters and microphyll preserved is dependent on the alternative approved and the specific compensation lands chosen.

9. Newmont staff members or qualified biological consultants will conduct a reconnaissance for potential sensitive species in areas proposed for disturbance in the wet season prior to that disturbance.

10. Mine pit walls within twenty feet above and below the projected long-term water levels will be designed to be as steep as possible, to minimize the development of vegetation that could serve as dietary pathways for ingestion of harmful compounds by birds and animals.

Species-Specific Impacts

Desert Tortoise

The following reasonable and prudent measures are proposed as necessary and appropriate to minimize the impacts of incidental take of desert tortoise:

1. On-site biological supervision/monitoring, along with clearance surveys and relocation efforts, shall be utilized to reduce the likelihood of harm/harassment to the desert tortoise.

2. Employee education programs, designated work areas, defined operational procedures, reclamation efforts, and a Microphyll Woodlands assessment shall minimize the impact of mine-related operations on both the desert tortoise and the species' associated habitat.

To be exempt from the prohibitions of Section 9 of the Act, compliance must meet with the following terms and conditions. These implement the reasonable and prudent measures described above and outline required reporting/monitoring requirements. These terms and conditions are non-discretionary.

1. Compensation for loss of habitat is necessary according to BLM requirements. Current requirements are based on a formula presented in Recommendations for Management of the Desert Tortoise in the California Desert (BLM, 1988), Instruction Memorandum CDD93-13, Instruction Memorandum CDD95-14, and Compensation for the Desert Tortoise, Desert Tortoise Management Oversight Group, 1999. The project proponent shall choose one of the following: 1) Acquire compensation lands. The location of these lands is to be determined jointly by BLM and CDFG. They will be located in the Chuckwalla Bench Area of Critical Environmental Concern (ACEC). The deed for these lands is to be delivered to the BLM. Or the project proponent shall 2) provide adequate funds (the amount to be determined by the BLM) to the BLM for the acquisition of compensation lands. These lands will be located in the Chuckwalla Bench ACEC. The last choice is for the project proponent to 3) make permanent improvements to desert tortoise habitat. This must be upon agreement with the Fish and Wildlife Service (the Service), CDFG and BLM. For the Proposed Action, the compensation ratio in Category III habitat is 1:1(130 acres in Category III habitat; 130 acres to be compensated); in Category II habitat the ratio is 4.5:1 (291 acres in Category II habitat; 1,310 to be compensated) for a total of 1,440 acres to be compensated. For the Reduced Footprint Alternative the compensation ratio in Category III habitat is 1:1 (109 acres in Category III habitat; 109 acres to be compensated); in Category II habitat, the ratio is 4.5:1 (246 acres in Category II habitat; 1,107 to be compensated) for a total of 1,216 acres to be compensated. The mine operator must work closely with the BLM in selecting the lands most benefiting the conservation and recovery efforts. Compensation requirements shall be agreed upon prior to permitting. NECI Biological Report, Appendix F shows the equation used to determine compensation ratios.

2. The Mine operator shall designate a field contact representative (FCR) who will be responsible for overseeing compliance with protective measures for the desert tortoise, involved in compliance coordination with the BLM, and authorized to halt any mine-related actions that may be in violation of the biological opinion. The FCR (a contract biologist, company environmental coordinator, project manager, or other appropriate mine employee) shall retain a copy of the tortoise stipulations and be available on-site for all project activities.

3. Only the authorized biologist and other persons confirmed by the Fish and Wildlife Service, under the auspices of the current biological opinion, shall be permitted to handle/relocate desert

tortoises. The Service and BLM must approve the wildlife biologist who must demonstrate experience in the proper handling of desert tortoises and locating tortoises and their sign. The BLM shall submit the names and credentials of individuals to the Service for review and approval at least 15 days prior to the onset of any mine-related operations. No excavation/surface disturbing activities will commence until the authorized biologist has been selected. A biological monitor or the authorized biologist shall be present during all surveying efforts (excluding archaeological work), any power line construction, overbuilding activities, pipeline installation, water well excavation, or road realignments. The qualified biologist must have education/training/experience in conducting surveys, monitoring/supervising project operations, and implementing tortoise avoidance and minimization measures.

4. The biological monitor/authorized biologist shall regularly inspect (a minimum of three times per day) any test holes or associated open trenches, if any. Entrapped tortoises/wildlife will be permitted to move from harm's way or carefully removed from the excavation site by the authorized biologist. A final inspection of trenches and holes shall be conducted by the biological monitor/authorized biologist just prior to backfilling. All test holes shall be immediately capped/sealed upon completion of drilling.

5. Desert tortoises may only be handled by the authorized biologist or FCR in the case of an emergency, and only when necessary. Any desert tortoise relocated or otherwise removed from areas with mine-related construction/excavation shall be handled in accordance with the procedures described in *Guidelines for Handling Desert Tortoises During Construction Projects* (DTC 1994, revised 1999). All tortoises shall be trans-located to an identified tortoise relocation site.

6. BLM, in consultation with the appropriate regulatory agencies and the proponent, will identify several relocation areas for the relocation of tortoises within the vicinity of the Mesquite Mine. These areas will be at least 0.5-1.0 mile apart in suitable Microphyll Woodland habitat and a reasonable distance from paved roads and extensively used dirt roads. In order to reduce potential competition, no more than two tortoises should be relocated in each area.

7. The authorized biologist shall maintain a complete record of every desert tortoise encountered and moved from harm's way during all mine-related efforts. At a minimum, the information shall include: location (written description and map) of the tortoise finding, date and time of observation, and details of the relocation site; tortoise life history information (i.e., weight, length, width, height, and sex); general condition and health, including any apparent injuries/state of healing and occurrence of bladder voiding upon handling; and diagnostic markings (e.g., identification number or previously marked lateral scute).

8. Desert tortoises removed/relocated from the mine site or ancillary areas shall be marked for future identification. An identification number (using the acrylic paint/epoxy technique) will be affixed to the fourth costal scute (Service 1990b), and a 35 mm photograph (slide) of the carapace, plastron, and fourth left costal scute shall be obtained. No notching or replacement

of fluids by injection (i.e., syringe) shall be authorized. Any water basins, bowls, or other containers provided to a tortoise for re-hydration shall be promptly removed from the field following determination by the authorized biologist that adequate fluid replacement has occurred.

9. Upon locating a dead or injured desert tortoise, BLM will be notified within 24 hours. The BLM must then notify the appropriate field office of the Service by telephone within three days of the finding. Written notification to BLM and USFWS must be within fifteen days of the finding. The information provided must include the date and time of the finding or the incident (if known); location of the carcass; a photograph; cause of death, if known; and other pertinent information. Desert tortoise remains shall be collected, frozen as soon as possible, and delivered to the BLM. Injured animals shall be transported to a qualified veterinarian for treatment at the expense of the project proponent. If an injured animal recovers, the Service should be contacted for final disposition of the animal.

10. The authorized biologist shall submit a summary report to the Service and BLM upon completion of the clearance surveys, relocation/handling efforts, and any injuries/deaths encountered during mine-related activities. Additionally, the report will include an evaluation of the effectiveness of the avoidance/minimization measures and possible recommendations to further reduce the direct/indirect effects of the mining operations on desert tortoise and its associated habitat.

11. A raven monitoring program shall be conducted over the project's lifetime to determine whether mining actions promote an increase in the relative abundance of ravens, and, correspondingly, a higher predation rate on desert tortoise. Five monitoring stations will be established within and around the proposed site (i.e., the center and each corner) and visited on a monthly basis. During a standard observation period (15 min), the biological monitor, authorized biologist, FCR, or other Service and BLM approved individual shall record raven numbers and behavior and inspect any nest sites for desert tortoise remains, along with documenting all carcasses found (i.e., number, size, relative time of death, and distance from nest). A report will be submitted to the Service and BLM before July 1st of each year, summarizing the monitoring results. A comprehensive raven management program shall be developed and instituted in the event that significant increases in raven numbers are observed over time.

12. A desert tortoise education program shall be presented to all mine employees conducting activities at the project site, process area, or ancillary facilities. Personnel participation in the program shall precede any initiation of project actions. Following the onset of mining, new employees must formally complete the training prior to working on-site. The BLM-approved tortoise program will contain, at a minimum, the following topics: (1) desert tortoise distribution/occurrence; (2) general behavior and ecology; (3) species' sensitivity to human activities; (4) legal protection; (5) penalties for violation of State or Federal laws; (6) reporting requirements.

13. A specially designed tortoise proof fence shall be constructed around proposed disturbance areas. The fence will consist of a non-breachable barrier and support structures. Galvanized hardware cloth of 0.635 cm (0.25 in) diameter shall be attached along the base of the fence and buried a minimum of 30 cm (12 in) underground with an aboveground extension of at least 46 cm (18 in). If burial is not feasible, the bottom one-half of the fence shall be positioned flat on the ground, opposite the project/ process area, and appropriately weighted (e.g., large rocks) or secured. Overall, the smaller 0.635 cm (0.25 in) mesh size was selected to prevent tortoise entry into the mine site and minimize the likelihood of incidental reptile mortality. Fence-ensnared lizards could attract ravens and potentially/artificially increase predation upon the resident tortoises.

14. After fence installation, the authorized biologist shall conduct a thorough survey for desert tortoises within the site. All desert tortoises found shall be removed. If the removal is during the season of above ground activity, the desert tortoises shall be placed beside a burrow of appropriate size. If the removal is not in the season of above ground activity, the tortoise shall be moved (dug out of burrow if necessary) on a seasonably warm day and placed at the mouth of a burrow of appropriate size. If the desert tortoise does not enter the burrow, an artificial burrow may be needed. The authorized biologist shall be allowed some judgement and discretion to ensure that survival of the desert tortoise is likely. All tortoises shall be relocated to identified areas.

15. No later than 90 days after completion of any necessary fence construction, the FCR and the authorized biologist shall prepare a report for the BLM. The report shall document the effectiveness and practicality of the mitigation measures. Additionally, it shall include the number of desert tortoises excavated from burrows, the number of desert tortoises moved from the site, the relocation site(s), the number of desert tortoises killed or injured, and the specific information for each desert tortoise listed above. The report shall make recommendations for modifying the stipulations to enhance desert tortoise protection or to make it more workable for the operator.

16. The fence shall be regularly monitored and corrective action promptly taken to maintain the overall integrity of the tortoise barrier. Following storms, the fence's structure shall be assessed and immediately repaired at all damaged locations.

17. In washes and other areas susceptible to flash flooding, "break-away" tortoise fabric may be installed. These segments shall be loosely tied to the fence on higher ground, permitting the fabric to "break-away" in the event of substantial surface flows.

18. Small mesh nets, a solid high density polyethylene/polypropylene cover, or other appropriate screening shall be placed over the leach pad's adjoining ponds (i.e., pregnant and barren solution ponds) to prevent tortoise access and possible injury/mortality. The coverings will be regularly inspected and maintained by the applicant for the duration of the project.

19. During the development of all ancillary facilities/features (i.e., power lines, pipeline, water wells, or road realignments) all vehicles and equipment shall be limited to established roads, designated/marked spur roads, trails, and approved rights-of-way. To the maximum extent practicable, material stockpiling, equipment storage, and vehicle parking shall occur in areas of prior disturbance or generate not greater than 0.4 ha (1 acre) of new surface impacts. Additionally, to minimize surface disturbance to the surrounding habitat, the boundaries of the work areas shall be conspicuously staked, flagged, or marked. For all project-related actions, the crushing/removal of perennial vegetation shall be avoided to the maximum extent practicable.

20. Any project-related vehicle or equipment operating on the mine's ancillary/non-haul roads shall not exceed a speed limit of 25 mph. The project proponent will be responsible for enforcing this speed requirement on its employees, contractors, and agents. Additionally, cross-country or off-road travel will not be permitted at any time, except under life threatening/emergency situations.

21. Employees shall inspect beneath parked vehicles and equipment prior to traveling. If a desert tortoise is encountered, no action shall be taken until either the animal has safely and voluntarily moved away from the parked vehicle or the authorized biologist has relocated the tortoise out of harm's way.

22. If it is necessary for a worker to park temporarily outside of a cleared enclosure, the worker shall inspect for desert tortoises under the vehicle prior to moving it. If a desert tortoise is present, the worker shall carefully move the vehicle only when necessary or shall wait for the desert tortoise to move out from under the vehicle.

23. Desert tortoise notification and speed limit signs shall be posted and maintained within the project's boundaries. Employee parking areas will have conspicuous signs alerting personnel to the presence of tortoises. Speed limits shall be posted within the mine site and along all regularly traveled ancillary/non-haul roads.

24. BLM, in consultation with the Service, shall pre-approve the type(s) of chemical dust suppressant(s) used on haul/maintenance/access roads prior to their application.

25. All trash and food items shall be promptly stored in raven and coyote proof containers and regularly conveyed from the mine site. Project structures/design will minimize the potential for raven nest or perch sites and no mining features (e.g., other buildings, power/water line enhancements, etc.) beyond the scope of the currently proposed action shall be approved or authorized.

26. Structures that may function as raven nesting or perching sites are not authorized except as specifically stated in the plan of operation notice. The project proponent shall describe anticipated structures to the BLM during initial project review.

27. No pets shall be permitted at the project site, process area or ancillary facilities, at any time. Furthermore, firearms will be strictly prohibited, except for security personnel.

28. Road kill found along the mine's primary access way shall be promptly removed/buried to reduce the attraction of ravens and other potential tortoise predators to the area. Additionally, no feeding of coyotes, kit foxes, or ravens shall be allowed.

29. Upon completion of the Mesquite Mine Project, all mine-related materials and vehicles/equipment shall be promptly removed from the site. Machinery and personnel involved with the mine's subsequent reclamation shall only be permitted in the project area during the course of revegetation efforts. Once reclamation measures have been implemented, no associated equipment and supplies will be allowed to remain on-site.

Other Wildlife Species Mitigation

Bat Species

Reclamation of microphyll woodland done concurrently with mine development may reduce impacts, if any, to California leaf-nosed bat, Greater Western Mastiff bat, small-footed Myotis, Desert pallid bat, spotted bat, and Townsend's Big-eared bat.

Western Chuckwalla

1. Avoid chuckwalla habitat whenever possible.
2. Ensure that chuckwalla habitat that is avoided will have a corridor of an undisturbed lands connecting to habitat offsite. These avoidance and connection areas will be identified on a map prior to permitting.

Mule Deer

1. A mule deer fence, whose design is approved by the game branch of CDFG, should be installed along the entire perimeter of the mine property. Fences will be routinely checked for breaks.
2. Attractive water will be fenced, contained, or otherwise made unavailable to mule deer. These deterrents will be routinely checked to assure mule deer cannot access these water sources. Death of a mule deer on the mine will be reported to CDFG within one week of occurrence.

Plant Species Mitigation

Fairy Duster

1. Microcatchments will be installed in the reclaimed areas to provide areas of moisture enhancement and to aid in seed germination.

2. Where applicable, disturbed areas will be scarified to provide more conducive surfaces and substrate conditions for natural plant propagation.

3. Seeds will only be collected from plants on and in proximity to the Mesquite Mine property to enhance the potential for successful re-vegetation. These seeds shall be used in future reseeding of reclaimed areas as well as in any nursery programs conducted on-site for later transplant.

4. Mature fairy duster plants within the proposed expansion areas will be salvaged and transplanted into reclaimed areas.

5. Cuttings from local fairy duster plants will be utilized to augment population numbers.

6. Any fairy duster plants that are lost as a result of the Mine expansion will be mitigated on a 1:1 basis, either though planting of new plants in appropriate areas as described above, or through preservation of fairy duster plants located within the planned compensation lands.

Slender-lobed 4 O'clock flower

1. To the extent possible, microcatchments could be installed in any areas that benefit from moisture enhancement and continued input of wind-dispersed seed.

2. Where applicable, disturbed areas could be scarified to provide a more conducive surfaces and substrate conditions for natural plant establishment.

Winged Cryptantha

1. To the extent possible, microcatchments could be installed in any areas that benefit from moisture enhancement and continued input of wind-dispersed seed.

2. Where applicable, disturbed areas could be scarified to provide more conducive surface and substrate conditions for natural plant establishment.

Ribbed Cryptantha

1. To the extent possible, microcatchments could be installed in any areas that benefit from moisture enhancement and continued input of wind-dispersed seed.

2. Where applicable, disturbed areas could be scarified to provide more conducive surface a substrate conditions for natural plant establishment

4.1.3.5 Level of Significance After Mitigation

The mitigation measures identified would mitigate the potential mine expansion site-related impacts, such that impacts would not be significant.

4.1.4 Cultural Resources

This section is based on a cultural resource technical report prepared by Mooney & Associates [February 2000] for the proposed expansion.

4.1.4.1 Assumptions and Assessment Guidelines

Implementation of the proposed Mesquite Mine Expansion project would require local and state approvals to demonstrate compliance with CEQA. It would also require federal approval to achieve compliance with NEPA, the National Historic Preservation Act of 1966 (NHPA) and other applicable legislation and regulations. Section 106 of NHPA requires that federal agencies take into account the effects of their undertakings on properties listed or eligible for listing in the National Register of Historic Places (NRHP) and that the Advisory Council on Historic Preservation (ACHP) be afforded a reasonable opportunity to comment on the undertaking. Undertakings include those that are federally-assisted and federally-permitted, as well as those implemented by the federal agency. The regulations at 36 CFR Part 800, "Protection of Historic Properties," define the process used by federal agencies to meet these responsibilities.

The BLM has developed a Programmatic Agreement (PA) and State Protocols to meet its responsibilities under Section 106, 110(f) and 111(a), rather than by following the procedure set forth in 36 CFR Part 800.

Regulatory Context

The purpose of the Section 106 compliance process is to accommodate the needs of federal undertakings with the concerns of historic preservation and to resolve potential conflicts between the two in the public interest. This is accomplished through a consultation process among the federal agency, the ACHP, the State Historic Preservation Officer (SHPO), and other interested parties during the early planning stages of the undertaking. Since BLM manages its cultural resource program in accordance with a Programmatic Agreement among ACHP, SHPO, and BLM, ACHP consultation is not required for individual undertakings as long as the requirements of the PA are met.

The basic steps in the Section 106 process are:

- Step 1 – Identification and Evaluation of Historic Properties (Cultural Resources)
- Step 2 – Assessment of Effects
- Step 3 – BLM/SHPO/ACHP Consultation
- Step 4 – ACHP Comment

Current Status of the Proposed Action

The Section 106 process has been completed for the Proposed Action. BLM, in consultation with SHPO, has determined that no historic properties would be adversely affected by the Proposed Action.

4.1.4.2 Significance Criteria

Significance criteria for the Proposed Action were determined based on National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA) Guidelines, Appendix G, Environmental Checklist Form (approved January 1, 1999) and on performance standards or thresholds adopted by responsible agencies. An impact may be considered significant if the Project results in one or more of the following:

- Disturbance or destruction of an important archaeological resource.
- Site testing or data recovery in a manner inconsistent with standards of the Registry of Professional Archaeologists.
- Recreational collection of artifacts that destroys their scientific value and degrades the heritage value of a resource.
- Substantial adverse change in the significance of a historical resource that is listed or eligible for listing on the NRHP, State Register of Historic Resources or on a local register of historic resources.
- Substantial adverse change in the significance of a unique archaeological resource.
- Disturbance of any human remains, including those interred outside of formal cemeteries.

4.1.4.3 Impacts of the Proposed Action

Based on a Class III survey and limited testing conducted during March, April, July, and August 1999, a total of 27 sites were identified and evaluated. The Quechan Cultural Committee, the local Native American organization, was consulted extensively throughout the resource identification and evaluation phases, as part of the Section 106 consultation process. Based on the evaluation and Native American consultation, the finding was made that no historic properties will be affected by the Proposed Action.

4.1.4.4 Mitigation Measures

Implementation of the proposed Mesquite Mine expansion would not result in significant impacts to cultural resources. As a result, no mitigation measures are necessary.

4.1.4.5 Level of Significance After Mitigation

No mitigation is necessary. Significant impacts would not occur.

4.1.5 Paleontological Resources

4.1.5.1 Impacts of the Proposed Action

No paleontological resources exist at the site. Therefore, no impacts to paleontology would occur as a result of the Proposed Action.

4.1.5.2 Mitigation Measures

Development of the Proposed Action would not result in paleontological resource impacts. Therefore, no mitigation would be required.

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4.1.6 Transportation

4.1.6.1 Assumptions and Assessment Guidelines

A thorough review of potential traffic conditions, which could be caused by the Proposed Action, was performed. The Proposed Action would be considered to have a significant transportation impact if project-related activity causes one of more of the following to occur:

- The volume of traffic on a given roadway to increase substantially in relationship to its design capacity (i.e., causing the existing peak-hour level of service (LOS) to drop substantially); or
- Substantial increase in road hazards; or
- Inadequate emergency access.

4.1.6.2 Impacts of the Proposed Action

Caltrans has indicated that the maximum design capacity of SR 78 exceeds 60,000 trips per day, where a trip is the passage of one vehicle in either direction across a particular location. The average daily traffic as of 1998 on SR 78 was 1,600 trips (Caltrans, 1998). Therefore, during those years, the stretch of SR 78 which passes the mine expansion site operated at LOS A or about 2.7 percent of its design capacity. However, winter weekend traffic, beginning the Friday afternoon before and ending the Monday morning after weekends from October 1st to May 31st, on this portion of SR 78 can reach LOS F flow rates.

The planned mine expansion may require an additional 20 to 30 permanent employees. This potential increase would be insignificant and would not adversely affect long-term traffic levels and patterns on SR 78 and the feeder roads. Construction equipment for the proposed expansion is already present onsite, though a very small number of temporary construction personnel may be required for specialized tasks (e.g., electrical contractors). These temporary personnel would only be needed for a short-time period (e.g., days to weeks) and would not impact traffic conditions. Since no substantial change in traffic levels increase in road hazards, or inadequate access would occur as a result of the proposed project, impacts would not be significant.

During the winter weekend period, project-related traffic would continue to contribute to an already overcrowded highway; however, since no substantial change in traffic levels will occur, no cumulatively significant impacts to SR 78 will result at this time. Nevertheless, an effort will be made to avoid scheduling project-related deliveries during these high-volume periods.

4.1.6.3 Mitigation Measures

As no significant impacts were identified in this analysis, no mitigation measures are necessary.

4.1.6.4 Level of Significance After Mitigation

No significant impact to transportation would occur.

4.1.7 Noise

4.1.7.1 Assumptions and Assessment Guidelines

Noise emissions from the project site are regulated by the Imperial County Zoning Ordinance and the Noise Element of the Imperial County General Plan. The thresholds for significance for the noise analysis in this EIR/EIS are based on the Imperial County General Plan Noise Element.

The Noise Element requires the County of Imperial to perform a formal acoustical analysis study of proposed discretionary project that may generate excessive noise if the project:

- Would be located in a Noise Impact Zone as defined in the Noise Element.
- Has the potential to generate noise in excess of the Property Line Noise Limit thresholds stated in the Noise Element.
- Would have the potential to result in a significant increase in noise levels to sensitive receptors in the area.

The Mesquite Mine is not located in a Noise Impact Zone and, because project activities would generally occur one-half mile or more from the project property line, the activities would not be a threat to exceed Property Line Noise Limit thresholds. Therefore, the following analysis evaluates the potential for this project to result in significant increases in noise levels to sensitive receptors in the area.

Noise modeling for the mine was not performed because of the remote site location and the lack of any receptors near the project boundary. The area is virtually deserted, except for the Mesquite Mine. Additionally, most of the proposed activities would be mostly buffered by the fact that they would occur within the mine pits, which would have walls that would act to alleviate project-related noise. Otherwise, noise conditions will remain unchanged from current conditions. Any occasional receptors near the project fenceline (e.g., campers) would be unlikely to experience substantial noise events.

4.1.7.2 Impacts of the Proposed Action

Proposed Mine Expansion Site

The proposed mine expansion would produce the same noise events onsite as are occurring now, including the following:

- Removal and handling of ore and overburden.
  - Drilling
  - Blasting
  - Ore and overburden loading, hauling, and dumping

- Construction of haul roads and structure
  - Earthmoving activities
  - Construction activities

Potential onsite impacts to mine employees and visitors could occur from these noise events. Federal and State laws governing worker safety, which require a safe workplace be maintained, would require the use of safety equipment and procedures to prevent noise impacts to employees and visitors. Safety equipment and procedures are discussed in Chapter 4.0, Section 4.1.12, Environmental Health and Public Safety. Because of these safety requirements, noise impacts to onsite employees and visitors would not be significant.

Potential offsite mine activity noise impacts would not be significant because of the distance between the mine expansion activities and offsite receptors. Noise that would occur would be similar to that of the existing mine and similar to that normally experienced with earthmoving activities.

Noise from the Proposed Action is not likely to affect the occasional gravel withdrawal operations in the project area, because of the distance from the project site and the local-generated noise from their own equipment. The proximity and orientation of the Chocolate Mountain Aerial Gunnery Range (CMAGR) from the proposed mine expansion site makes noise impacts to this area unlikely. The border of the aerial gunnery range is adjacent to the northern mine boundary. As a result, military personnel conducting occasional ground activities in or near the aerial gunnery range may be exposed to some noise from the mine, but not at levels that would be substantially different from existing mining activities.

Traffic along SR 78 would generally be located one or more miles from mine activities and would not experience large noise impacts. Any possible noise impacts to SR 78 traffic would occur in connection with the drainage system construction along the eastern site boundary and during placement of material on the OISAs or the leach pads closest to SR 78. This noise would be temporary, would only be associated with normal earth moving equipment, and would most likely be inaudible because of driving related noise.

Some visitors could also hear the mine activities when walking an interpretive trail that has been established along the mine access road to allow tourists to observe mining activities and historic displays for the area. This noise would be similar to that associated with the existing mining activities and, therefore, would not substantially change from existing conditions.

4.1.7.3 Mitigation Measures

Incorporated by Regulations

The Applicant shall comply with the following noise mitigation measures that are required by law:

- Imperial County General Plan, which establishes noise emissions controls for the entire County.
- Applicable Occupational Safety and Health Administration (OSHA) regulations set forth in 29 CFR 1920 and 40 CFR 241 and California Occupational Safety and Health Administration (Cal OSHA) regulations set forth in 14 CCR 3 shall be implemented by the Applicant.

Incorporated to Avoid Significant Impacts

Noise impacts to sensitive receptors from the Proposed Action would not be significant with implementation of the above mitigation measures. As a result, the noise emissions from the Proposed Action would be consistent with Imperial County noise control measures. No additional noise mitigation measures beyond those identified as incorporated by regulation or as part of the project design in Section 4.1.7.3 would be required.

4.1.7.4 Level of Significance After Mitigation

Based upon regulatory requirements and noise attenuating measures that would be incorporated into the project design, no significant impact due to noise would occur from the Proposed Action.

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4.1.8 Air Quality

This section assesses the potential air quality impacts of the Proposed Action, and finds that they are less than significant. The analysis is representative of both the Proposed Action and the Reduced Footprint Alternative because the emission sources and rates are the same. The sources were placed conservatively to produce maximum impact for either alternative, which differ mostly in their specific spatial configuration. Additional details of the analysis are provided in Air Quality Appendix A (not in this document). This section is organized to introduce the objectives of the assessment, followed by assessment guidelines and assumptions about the Proposed Action. Air emission sources are then described along with their potential impacts. Measures to mitigate impacts are discussed, and finally, the level of significance after mitigation is described.

4.1.8.1 Introduction

The detailed analysis of the Proposed Action includes specification of the scenario that would cause the maximum potential impact. Maximum production rate, expressed as the amount of mined overburden/interburden and ore, and the location of mining activities are key variables in specifying the maximum impact scenario.

The analysis begins with the identification of project sources of air pollutants. Emission factors are based on the scientific literature.(1) Emissions are estimated from factors and characteristics of each emission source to create input information needed for the Industrial Source Complex (ISC3) dispersion model. The ISC3 model requires source locations, emission rates, annual meteorological data, and receptor locations, in order to predict ground-level ambient air quality concentrations from simulated atmospheric dispersion.

Meteorological data for one year (April 1, 1991 through March 31, 1992) from the Mesquite Mine monitoring tower (see Figure 3.8-2) is used in the dispersion model. The model computes ambient concentrations of criteria and noncriteria pollutants at specific receptor points. Noncriteria pollutants are used to compute potential carcinogenic, and chronic and acute noncarcinogenic health risks.

Mitigation measures capable of reducing project-related impacts to below a level of significance are identified. The air quality analysis concludes that these measures, if implemented, would mitigate potential impacts to insignificant levels.

4.1.8.2 Assumptions and Assessment Guidelines

Assumptions and assessment guidelines are explicitly described to make clear the maximum scenario that is being assessed, and thresholds below which potential impacts to air quality would be insignificant. For convenience, assumptions are classified as the following sections: general, emission sources (mobile, stationary, and fugitive), and measures of significant impacts.

(1) Including documents and computer programs made available on the Internet by EPA and CARB.

General

Air quality impacts are analyzed for the Proposed Action, which is scheduled to operate through the year 2006. Although air pollution control technology continues to advance, the analysis is conservative by assuming current control technology.

Basic production parameters and related additional assumptions are listed in Table 4.1.8-1. An important change in the operation of the mine for the Proposed Action is that an electric-powered shovel and drills would replace the current diesel-powered shovels and drills and shovel for the most part. A maximum of 35 percent of shoveling would be done by diesel-powered equipment and would occur at depths in the East Rainbow Pit below 300 feet. This use of electric drills would substantially decrease the amount of diesel-fuel, associated air emissions, and potential offsite impacts. Comparison with Table 3.8-14 shows that one difference in quantitative assumptions is the maximum speed limits. The limit is 35 miles per hour for existing conditions. For the Proposed Action, the speed limit is 38 mph, slightly higher. In these tables, the expansion and current maximum daily production rates are set 50 percent higher than the average daily production rates, respectively. This increase provides an adequate margin to assure the analysis accounts for days of maximum activity.

Expansion of mining activity for the Proposed Action occurs in new areas identified in Figure 4.1.8-1. Table 4.1.8-1 contains assumptions related to the location and distribution of emissions needed for modeling their dispersion.

Emission Sources

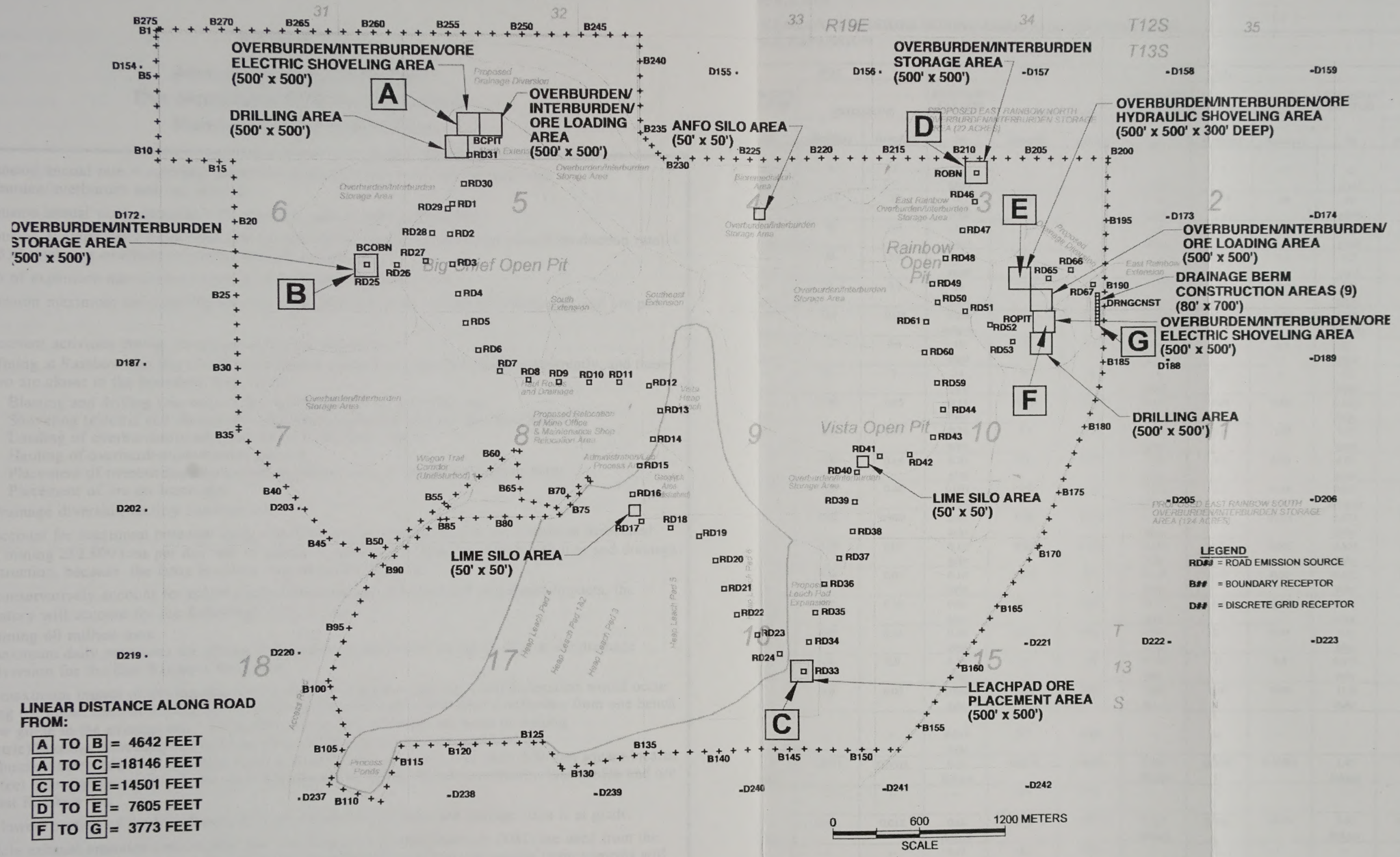
Mesquite Mine is a stationary source, regulated as described in Section 3.8.2. Within the mine there are three types of emission sources mobile, point and fugitive. Mobile sources are discussed first because this category emits the most. The mobile emissions include five primary pollutants[2]. Point sources at the mine emit the same five primary pollutants. Fugitive sources emit particulates with aerodynamic diameters less than or equal to 10 micrometers (PM_{10}).

The scenario of operations for the Proposed Action that would cause the maximum potential air quality impacts is based on the same level of activities as currently permitted. Both are limited to a total annual production of 60 million tons of overburden/interburden and ore. During the 6-year period of the Proposed Action, the time in the year with maximum emissions will occur when the drainage diversion facilities will be constructed at the same time as mining operations. This emission source lasts for a period of up to 60 days.

The mine has a fleet of off-road equipment to carry out mining activities. The fuel used to mine 24 million tons per year is known, and is increased by a factor of 2.5 (= 60/24) to obtain the fuel needed to mine 60 million tons per year.

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(2) The total set of criteria pollutants, each of which has ambient air quality standards (AAQS), is listed in Table 3.8-3. Nitrogen oxides (NO_X), PM_{10}, sulfur oxides (SO_X), and carbon monoxide (CO) are the only criteria pollutants having large enough emission rates to contribute to an emission inventory. Reactive organic compounds (ROC) is a substantial emission that does not have its own AAQS, but, is a precursor to ozone (O_3).



LINEAR DISTANCE ALONG ROAD FROM:

- A TO B = 4642 FEET
- A TO C = 18146 FEET
- C TO E = 14501 FEET
- D TO E = 7605 FEET
- F TO G = 3773 FEET

8/3/00

SOURCE: TRC, 1999.

Mesquite Mine Expansion EIR/EIS

Source and Receptor Locations

FIGURE 4.1.8-1

BRG CONSULTING, INC.

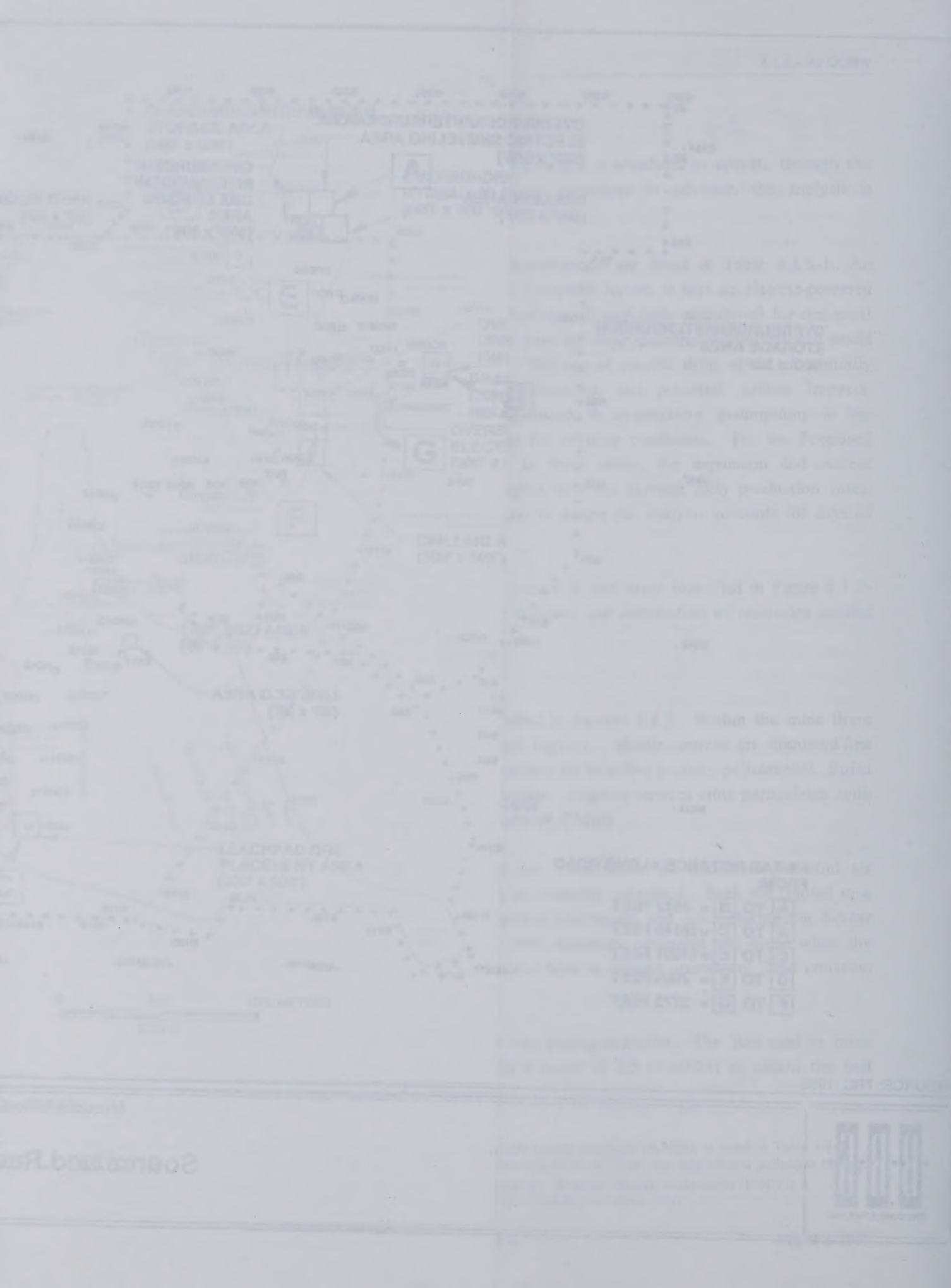


Table 4.1.8-1

Assumptions to Calculate The Maximum Emission Inventory Mesquite Mine Expansion

- Expansion annual rate = currently permitted production rate = 60 million total tons overburden/interburden and ore per year.
- Expansion annual work schedule = 356 days per year, assuming 9 holidays.
- Expansion average daily production rate (to accomplish maximum permitted annual production rate) = 168,539 total tons overburden/interburden and ore per day.
- Ratio of expansion maximum to average daily production rates = 1.5.
- Expansion maximum daily production rate = 252,809 total tons overburden/interburden and ore per day.
- Concurrent activities during maximum expansion scenario:
  - Mining at Rainbow and Big Chief Pits (chosen because two pits will be used concurrently, and these two are closer to the boundary than Vista):
    - Blasting and drilling (electric) of new overburden/interburden and ore
    - Shoveling (electric and diesel) of overburden/interburden and ore into haul trucks
    - Loading of overburden/interburden and ore into haul trucks
    - Hauling of overburden/interburden and ore
    - Placement of overburden/interburden on storage area or drainage diversion berm
    - Placement of ore on leach pad
  - Drainage diversion facility construction
- To account for maximum potential daily emissions and air quality impact, the emissions associated with mining 252,809 tons per day will be placed in appropriate areas for mining activities and drainage construction, because the latter is closest to a boundary (50 feet).
- To conservatively account for maximum potential annual emissions and associated impacts, the inventory will account for the following:
  - mining 60 million tons
  - maximum daily emissions for mining and drainage construction during 60 days at the drainage diversion for the East Rainbow Extension
- The maximum impact of mining activities at the East Rainbow and Big Chief Extensions would occur during the initial days of mining the currently undisturbed and unpermitted overburden from one bench below grade in the existing pits. Three 500-foot squares represent the areas of drilling (electric)/blasting, shoveling (electric) overburden/interburden and ore, and loading overburden/interburden and ore (one each) in each of these two pits. An extra 500-foot square located 300 feet below grade represents the area of hydraulic shoveling (diesel) overburden/interburden and ore in East Rainbow Pit.
- The lowest portion of the East Rainbow North Overburden/Interburden Storage Area is at grade.
- Vehicle exhaust emission factors from the first expansion project year (i.e. 2001) are used from the literature because they are higher than for later years and because evolving engine improvements will reduce emissions slightly each successive year.
- Onsite vehicle speed limit = 38 miles per hour.

Table 4.1.8-1
Assumptions to Calculate The Maximum Emission Inventory Mesquite Mine Expansion

Continued

- Fugitive dust calculations for unpaved roads assume a PM_{10} control efficiency of 80 percent, and a width of 100 feet. The 80 percent requires that the current watering frequency and application rate of 0.18 gallons per square yard be augmented by occasional application of a chemical suppressant. A ground inventory of at least 0.13 gallons of petroleum resin (or equivalent chemical suppressant) per square yard must be built up by at least 5 biweekly applications of 1 part resin to 5 parts water.
- The boiler and carbon kiln are heated with liquid petroleum gas (LPG) having a heat of combustion of 94,000 British Thermal Units (BTU) per gallon and a density of 4.20 pounds per gallon.
- The PM_{10} emission factor for the induction (electric) furnace is 0.019 pounds per hour, based on source tests on similar furnaces at the Twin Creeks Mine in Nevada. Other emission factors are in Appendix A.
- The distributions of each equipment type at the areas of mining activity are listed in Appendix A Air Quality Appendix A.
  - The diesel-fueled hydraulic shovel is limited to a maximum of 35 percent of the digging of overburden/interburden and ore.
  - The hydraulic shovel would operate at depths in the East Rainbow Pit no closer to the surface than 300 feet.
- The drainage diversion structure would be constructed during the 2 winter months of December and January. If construction were to occur during other periods in the year, then the Northeast Boundary PM_{10} sampler would be used to confirm compliance with the California 24-hour PM_{10} ambient air quality standard. {TRC}

99-116 (2/28/00/ks)

Mining activities occur at various locations around the mine. These locations will change during the expansion period. The specific activity locations chosen for the analysis are selected as a realistic combination that could create maximum potential air quality impacts. Figure 4.8.1-1 has two sets of 500-foot squares to indicate areas for drilling, electric shoveling overburden/interburden and ore, and loading overburden/interburden and ore in Rainbow and Big Chief Pits. In addition, the Rainbow Pit also has a 500-foot square to indicate the area for hydraulic (diesel-fueled) shoveling of overburden/interburden and ore. These pits are chosen because they are closer to the property boundary than Vista Pit. The nearest receptors are those spaced along the property boundary at 100-meter intervals. A rectangle with nine segments, a width of 80 feet, and length of 700 feet is placed on the East Rainbow drainage diversion structure to represent placement of overburden/interburden closest to the property boundary during a short period of time (i.e., 60 days). This rectangle is no closer than 50 feet from the boundary.

A square, 500 feet on a side, is located at the East Rainbow North Overburden/Interburden Storage Area to show where overburden/interburden is placed when it is not used for constructing the drainage diversion structure.

Overburden/interburden from the Big Chief North Expansion is assumed to be placed in a 500-foot square on the west side of the mine. A 500-foot square is located at the south side for the placement of ore from both Rainbow and Big Chief Pits on Leach Pad No. 6 (see bottom of Figure 4.1.8-1). Smaller (i.e., 50-foot) squares in the central and east portions of the mine represent lime silos, while another 50-foot square on the north side of the mine represents the ANFO silo.

Mobile Sources

The types of off-road mining and construction equipment expected to be used for the Proposed Action are listed in Tables 4.1.8-2A and 4.1.8-2B. Fuel use data (in Air Quality Appendix A) for the eight most fuel-consuming types during the period January through July 1999, a year when production was approximately 24 million tons, were scaled up to estimate the fuel needed to mine 60 million tons of overburden/interburden and ore. No fuel use is shown for the drills because they will be electric-powered. Electric shovels will be used for 65 percent of shoveling, while the existing diesel-fueled hydraulic shovels will only be used for 35 percent of shoveling.

Haul trucks currently consume approximately 62 percent of the total diesel fuel used by heavy-duty equipment at the mine. Table 4.1.8-2A shows the estimated distances these trucks would travel to haul 168,539 tons of overburden/interburden and ore in one average production day and to haul 60 million tons in 1 year. Air Quality Appendix A contains the calculation of the annual distance, based on detailed analysis of the carrying capacity of the fleet of haul trucks.

The estimated fuel consumption of each mobile equipment type was combined with emission factors for the five primary criteria pollutants and other parameters to compute the daily and annual emission rates shown in Table 4.1.8-3. The emission factors were obtained from EPA and CARB (see Air Quality Appendix A).

Table 4.1.8-2a
Equipment Type Usage Without Drainage Construction
Mesquite Mine Expansion

Equipment Type	Maximum Number Of Units Per Type	Equipment Type Average Monthly Fuel Consumption(1) (Gallons/Month)	Equipment Type Monthly Usage(1) (Hrs/Month)	Equipment Type Daily Usage(2) (Hrs/Day)	Onsite Round-Trip Distance Traveled By Equipment Type		Notes
					Maximum (mi/yr)	Maximum (mi/day)(3)	
• Loaders	2	2,100	96	3.3	--	--	4
• Haul Trucks	21	363,831	12,248	412.9	1,176,571	4,840	
• Track Dozers	5	28,348	2,337	78.8	--	--	
• Rubber-Tire Dozers	5	13,837	1,228	41.4	--	--	
• Drills	3	0	903	30.4	--	--	5
• Cranes	3	--	2.5	0.084	--	--	
• Motor Graders	4	7,789	1,123	37.8	--	--	
• Shovel (diesel & electric)	4	38,376	1,842	62.1	--	--	6
• Fork Lift	5	--	200	6.7	--	--	
• Water Truck (diesel)	3	18,754	1,420		198,000	834	7,10
• Service Truck (diesel)	13	--	--	--	125,000	351	7
• Light Plant	13	--	1,250	42.1	--	--	
• Compressor	4	--	10	0.3	--	--	
• Welder	7	--	13	0.4	--	--	
• Pump	8	--	38	1.3	--	--	
• Small-Med. Truck (gasoline)	43	--	--	--	485,213	1363	7
• Medium Truck (diesel)	10	--	--	--	125,000	351	7
• Generator (diesel)	7	--	2,700	107	--	--	8
• Generator, portable (gasoline)	2	--	50.7	2	--	--	9

99-116 (3/2/00/mc)

1) Average monthly usage is calculated by multiplying current usage by the ratio of expanded mine production rate and current rate.

Max. mine expansion production (million tons of overburden/interburden and ore per year) = 60
Current mine production (million tons of overburden/interburden and ore per year) = 24 Ratio = 2.5

2) Total daily usage equals average monthly usage divided by working days per month. Average number of working days per month = 29.67
3) Days/Year = 356 (=365-9 Holidays)
4) Loader use and associated fuel consumption would be substantially decreased in the expansion mine plan.
5) Diesel-fueled drills will be replaced with electric powered drills, hence eliminating exhaust emissions.
6) The shoveling activities will use diesel-powered shovels 35% of the time, the rest will be with electric-powered shovels.
7) Water trucks travel distances proportional to total production. Annual mileages for expansion are equal to current mileages times production ratio.
8) Two diesel-fueled generators are assumed to run 24 hours a day to pump water out of Big Chief and Vista Pits. Other diesel-fueled generators are only run up to 1 hour per month for testing.
9) The two portable gas-fueled generators are assumed to operate 1 hour every mining day.
10) Maximum scenario day is based on average day to achieve permitted production times the following factor: 1.5

-- = Not applicable.

Table 4.1.8-2B
Equipment Type Usage with Drainage Construction, Mesquite Mine Expansion

EQUIPMENT TYPE	MAXIMUM NUMBER OF UNITS PER TYPE	EQUIPMENT TYPE AVERAGE MONTHLY FUEL CONSUMP-TION(1) (gal./ month)	EQUIPMENT TYPE MONTHLY USAGE(1) (hrs/month)	EQUIPMENT TYPE DAILY USAGE(2) (hrs/day)	ONSITE ROUND-TRIP DISTANCE TRAVELED BY EQUIPMENT TYPE		NOTES
					Maximum (mi/yr)	Maximum (mi/day) (3)	
• Loaders	2	2,100	96	3.3	--	--	4
• Haul Trucks	21	363,831	12,248	412.9	1,166,540	4,680	
• Track Dozers	5	28,348	2,337	78.8	--	--	
• Rubber-Tire Dozers	5	13,837	1,228	41.4	--	--	
• Drills	3	0	903	30.4	--	--	5
• Cranes	3	--	2.5	0.084	--	--	
• Motor Graders	4	7,789	1,123	37.8	--	--	
• Shovel (diesel & electric)	4	38,376	1,842	62.1	--	--	6
• Fork Lift	5	--	200	6.7	--	--	
• Water Truck (diesel)	3	18,754	1,420		198,000	834	7,10
• Service Truck (diesel)	13	--	--	--	125,000	351	7
• Light Plant	13	--	1,250	42.1	--	--	
• Compressor	4	--	10	0.3	--	--	
• Welder	7	--	13	0.4	--	--	
• Pump	8	--	38	1.3	--	--	
• Small-Med. Truck (gasoline)	43	--	--	--	485,213	1363	7
• Medium Truck (diesel)	10	--	--	--	125,000	351	7
• Generator (diesel)	7	--	2,700	107	--	--	8
• Generator, portable (gasoline)	2	--	50.7	2	--	--	9

-- = Not applicable. SOURCE: TRC, 2000

(1) Average monthly usage is calculated by multiplying current usage by the ratio of expanded mine production rate and current rate.
Max. mine expansion production (million tons of overburden/interburden and ore per year)
Current mine production (million tons of overburden/interburden and ore per year)

(2) Total daily usage equals average monthly usage divided by working days per month.
Average number of working days per month

(3) Days/Year = 356 (= 365-9 Hols)

(4) Loader use and associated fuel consumption would be substantially decreased in the expansion mine plan.

(5) Diesel-fueled drills will be replaced with electric powered drills, hence eliminating exhaust emissions.

(6) The shoveling activities will use diesel-powered shovels

(7) Water trucks travel distances proportional to total production. Annual mileages for expansion are equal to current mileages times production ratio.

(8) Two diesel-fueled generators are assumed to run 24 hours a day to pump water out of Big Chief and Vista Pits. Other diesel-fueled generators are only run up to 1 hour per month for testing.

(9) The two portable gas-fueled generators are assumed to operate 1 hour every mining day.

(10) Maximum scenario day is based on average day to achieve permitted production times the following factor:

Of the different equipment types, the haul truck category emits the most, accounting for at least two-thirds of the total onsite NOx emissions. This amount is consistent with the percentage of fuel used by haul trucks as noted above.

Small amounts of criteria pollutants would be emitted offsite by employees commuting to the mine and trucks delivering supplies. These emissions are shown in Table 4.1.8-4. The number of employees is estimated at 184, approximately 20 more than the current 164. The analysis assumes that ten trucks would deliver supplies to the Mine each day.

Stationary Point Sources

The Proposed Action contains the following point sources: six diesel fuel storage tanks, one gasoline storage tank, an electric smelting furnace, carbon kiln (burner section and drum section), a boiler, and an electrowinning cell (see Table 4.1.8-3). Only small amounts of ROC would escape from the vents on the fuel tanks.

Combustion of liquefied petroleum gas (LPG) in the boiler and carbon kiln (burner section only) emits small amounts of the five criteria pollutants (see Table 4.1.8-3). Small amounts of PM_{10} would continue to be emitted by the electric smelting furnace and electrowinning cell.

Fugitive Dust (PM_{10}) Sources

Fugitive dust, which includes PM_{10}, is generated by the travel of haul trucks and other vehicles on the unpaved roads; travel of employees and delivery vehicles on paved roads; wind erosion of soil disturbed by mining activities; dozing of overburden/interburden and ore in the loading areas, storage areas, and on the extension of Leach Pad No. 6; drilling, blasting, and lime and ANFO loading and unloading. As can be seen in Tables 4.1.8-5A and 4.1.8-5B (without and with drainage construction), the travel of haul trucks on unpaved roads is the largest generator of fugitive PM_{10}.

Fugitive PM_{10} emissions are controlled by watering the unpaved roads and activity areas. The watering frequency and application rate determine the effectiveness of this control. The southeast desert region of California has the highest potential evapotranspiration rate in the nation (Cowherd et al, 1988), and hence, requires frequent watering to control fugitive PM_{10} emissions.

The current fugitive dust control program for unpaved roads would be augmented to justify use of at least 80 percent control efficiency as shown in Tables 4.1.8-5A and 4.1.8-5B. One protocol that could be used to achieve this control level is use of a chemical dust suppressant. Following guidance in USEPA (1998), a chemical dust suppressant would be added to the haul road treatment water every two weeks at a concentration of 1 part to 5 parts water. The solution would be applied at the current rate of 0.18 gallons per square yard (gal/sq.yd.), which means that each application could add 0.03 gal/sq.yd. of petroleum resin to the ground inventory. After at least five applications, which would occur at the eighth week in the augmented program, the ground inventory would increase to 0.15 gal/sq.yd., for which the control efficiency would exceed 80 percent according to Figure 13.2.2-4 in USEPA (1998). More details on this calculation are given in Air Quality Appendix A. This dust suppressant protocol would be repeated if road maintenance completely removed the treated

TABLE 4.1.8-3

ONSITE STATIONARY AND MOBILE SOURCE CRITERIA POLLUTANT EMISSIONS DURING DRAINAGE CONSTRUCTION
MESQUITE MINE EXPANSION

SOURCE	ENGINE HP RATING	LOAD FACTOR (1)	DAILY USAGE FOR EQUIPMENT TYPE (2,3)	ANNUAL USAGE FOR EQUIPMENT TYPE (2)	ONSITE ROUND-TRIP DISTANCE TRAVELED BY EQUIPMENT TYPE		NOx			ROC			PM_{10}			SOx			CO			NOTES
					Maximum (mi/day)(3)	Maximum (mi/yr)	EMISSION FACTOR (4)	EMISSIONS (lbs/day)	EMISSIONS (tons/yr)	EMISSION FACTOR (4)	EMISSIONS (lbs/day)	EMISSIONS (tons/yr)	EMISSION FACTOR (4)	EMISSIONS (lbs/day)	EMISSIONS (tons/yr)	EMISSION FACTOR (4)	EMISSIONS (lbs/day)	EMISSIONS (tons/yr)	EMISSION FACTOR (4)	EMISSIONS (lbs/day)	EMISSIONS (tons/yr)	
Mobile Sources																						
Loader	--	--	71 gal/day	25,200 gal/yr	--	--	146 g/gal	23	4	20 g/gal	3	1	13 g/gal	2	0	14 g/gal	2	0	45 g/gal	7	1	
Haul Trucks	--	--	18,396 gal/day	4,365,973 gal/yr	--	--	130 g/gal	5,263	625	6 g/gal	242	29	8 g/gal	326	39	14 g/gal	574	68	56 g/gal	2,271	270	
Track Dozer	--	--	1433.3 gal/day	340,174 gal/yr	--	--	129 g/gal	408	48.5	13 g/gal	40	4.7	11 g/gal	36	4.3	14 g/gal	45	5.3	36 g/gal	113	13.4	
Rubber-Tire Dozer	--	--	699.6 gal/day	166,046 gal/yr	--	--	198 g/gal	306	36.3	29 g/gal	45	5.4	6.7 g/gal	10	1.2	14 g/gal	22	2.6	122 g/gal	188	22.3	
Drill (electric)	--	--	0.0 gal/day	0 gal/yr	--	--	167 g/gal	0	0.0	15 g/gal	0	0.0	14 g/gal	0	0.0	14 g/gal	0	0.0	70 g/gal	0	0.0	(5)
Crane	240	0.43	1.0 hours/day	30 hours/year	--	--	0.023 lb/hp-hr	2.4	0.04	0.003 lb/hp-hr	0.3	0.00	0.002 lb/hp-hr	0.2	0.00	0.002 lb/hp-hr	0.2	0.00	0.009 lb/hp-hr	0.9	0.01	(6)
Motor Grader	--	--	263 gal/day	93,467 gal/yr	--	--	115 g/gal	67	11.9	6 g/gal	3	0.6	10 g/gal	6	1.0	14 g/gal	8	1.5	25 g/gal	14	2.6	
Shovel (diesel)	--	--	1702 gal/day	403,958 gal/yr	--	--	167 g/gal	626	74	15 g/gal	57	7	14 g/gal	51	6	14 g/gal	53	6	70 g/gal	261	31	(14)
Fork Lift	80	0.30	6.7 hours/day	2,400 hours/year	--	--	1.7 lb/hr	3.44	0.61	0.15 lb/hr	0.30	0.05	0.14 lb/hr	0.28	0.05	0.143 lb/hr	0.29	0.05	0.675 lb/hr	1.37	0.24	(7)
Water Truck (diesel)	--	--	--	--	834	198,000	9.68 g/mi	17.8	2.11	1.31 g/mi	2.4	0.29	0.75 g/mi	1.4	0.16	0.31 g/mi	0.6	0.07	7.27 g/mi	13.4	1.59	(8)
Service Truck (diesel)	--	--	--	--	351	125,000	6.82 g/mi	5.3	0.94	1.02 g/mi	0.8	0.14	0.50 g/mi	0.4	0.07	0.31 g/mi	0.2	0.04	6.01 g/mi	4.7	0.83	(9)
Light Plant	40	0.74	42.1 hours/day	15,000 hours/year	--	--	0.018 lb/hp-hr	22.4	4.00	0.002 lb/hp-hr	2.5	0.44	0.001 lb/hp-hr	1.2	0.22	0.002 lb/hp-hr	2.5	0.44	0.011 lb/hp-hr	13.7	2.44	(10)
Compressor	90	0.48	0.3 hours/day	120 hours/year	--	--	1.7 lb/hr	0.28	0.05	0.15 lb/hr	0.02	0.004	0.14 lb/hr	0.02	0.004	0.143 lb/hr	0.02	0.004	0.675 lb/hr	0.11	0.02	(7)
Welder	90	0.45	0.4 hours/day	150 hours/year	--	--	1.7 lb/hr	0.32	0.06	0.15 lb/hr	0.03	0.01	0.14 lb/hr	0.03	0.005	0.143 lb/hr	0.03	0.005	0.675 lb/hr	0.13	0.02	(7)
Pump, Water	180	0.74	1.3 hours/day	454 hours/year	--	--	1.7 lb/hr	1.60	0.29	0.15 lb/hr	0.14	0.03	0.14 lb/hr	0.13	0.02	0.143 lb/hr	0.13	0.02	0.675 lb/hr	0.64	0.11	(7)
Small-Med. Truck (gasoline)	--	--	--	--	1,363	485,213	3.19 g/mi	9.6	1.71	0.30 g/mi	0.9	0.16	0.05 g/mi	0.2	0.03	0.31 g/mi	0.9	0.17	5.84 g/mi	17.5	3.12	(11)
Medium Truck (diesel)	--	--	--	--	351	125,000	6.82 g/mi	5.3	0.94	1.02 g/mi	0.8	0.14	0.50 g/mi	0.4	0.07	0.31 g/mi	0.2	0.04	6.0 g/mi	4.7	0.83	(9)
Generator (diesel)	60	0.74	106.6 hours/day	32,400 hours/year	--	--	1.7 lb/hr	181	9.7	0.15 lb/hr	16	0.9	0.14 lb/hr	15	0.8	0.143 lb/hr	15	0.8	0.675 lb/hr	72	3.8	(7)
Generator (gasoline)	10	0.74	2.0 hours/day	608 hours/year	--	--	0.41 lb/hr	0.6	0.00	0.54 lb/hr	0.8	0.00	0.026 lb/hr	0.04	0.80	0.02 lb/hr	0.03	0.00	17.0 lb/hr	25	0.02	(12)
Stationary Sources																						
Smelting Furnace (electric)	--	--	24 hours/day	8760 hours/year	--	--	--	--	--	--	--	--	0.019 lb/hr	0.5	0.08	--	--	--	--	--	--	
Carbon Kiln (LPG), Burner Section	--	--	--	1.1 kgal/year	--	--	20 lb/kgal	0.06	0.011	0.55 lb/kgal	0.0017	0.0003	0.60 lb/kgal	0.0018	0.0003	0.017 lb/kgal	0.0001	0.00001	3.40 lb/kgal	0.01	0.002	(13,16)
Carbon Kiln / Drum Section	--	--	--		--	--	--	--	--	--	--	--	--	2.5	0.46	--	--	--	--	--	--	(15)
Boiler (LPG)	--	--	--	45 kgal/year	--	--	20 lb/kgal	2.4	0.4	0.55 lb/kgal	0.07	0.012	0.60 lb/kgal	0.07	0.013	0.017 lb/kgal	0.0021	0.0004	3.40 lb/kgal	0.41	0.08	(13,17)
Electro-winning Cell	--	--	24 hours/day	8760 hours/year	--	--	--	--	--	--	--	--	0.17 lb/hr	4.1	0.74	--	--	--	--	--	--	
Gasoline Storage Tank	--	--	--	--	--	--	--	--	--	--	13.9	2.54	--	--	--	--	--	--	--	--	--	
Diesel Storage Tank #1	--	--	--	--	--	--	--	--	--	--	7.7E-04	1.4E-04	--	--	--	--	--	--	--	--	--	
Diesel Storage Tank #2	--	--	--	--	--	--	--	--	--	--	3.9E-03	7.2E-04	--	--	--	--	--	--	--	--	--	
Diesel Storage Tank #3	--	--	--	--	--	--	--	--	--	--	0.35	0.06	--	--	--	--	--	--	--	--	--	
Diesel Storage Tank #4	--	--	--	--	--	--	--	--	--	--	5.2E-04	9.5E-05	--	--	--	--	--	--	--	--	--	
Diesel Storage Tank #5	--	--	--	--	--	--	--	--	--	--	1.1E-03	2.0E-04	--	--	--	--	--	--	--	--	--	
Diesel Storage Tank #6	--	--	--	--	--	--	--	--	--	--	1.1E-03	2.0E-04	--	--	--	--	--	--	--	--	--	
TOTAL								6,945	820		430	51		458	55		724	86		3,009	353	

TABLE 4.1.8-4
OFFSITE CRITERIA POLLUTANT EMISSION INVENTORY
MESQUITE MINE EXPANSION

SOURCE	TOTAL DAILY USAGE [1]	TOTAL ANNUAL USAGE [2]	MAXIMUM NUMBER OF UNITS [3]	OFF-SITE ROUND-TRIP DISTANCE		NOx			ROC			PM_{10}			SOx			CO			NOTES
				(mi/day-unit)	(mi/yr-unit)	EMISSION FACTOR	EMISSIONS (lbs/day)	EMISSIONS (tons/yr)	EMISSION FACTOR	EMISSIONS (lbs/day)	EMISSIONS (tons/yr)	EMISSION FACTOR	EMISSIONS (lbs/day)	EMISSIONS (tons/yr)	EMISSION FACTOR	EMISSIONS (lbs/day)	EMISSIONS (tons/yr)	EMISSION FACTOR	EMISSIONS (lbs/day)	EMISSIONS (tons/yr)	
Commuting Small-Med. Cars/Trucks (gasoline)	1	356	92	90	32,040	2.78 g/mi	51	9.0	1.17 g/mi	21.4	3.80	0.00 g/mi	0.0	0.00	0.06 g/mi	1.1	0.19	24.69 g/mi	450.7	80.2	4
Delivery Trucks (diesel)	1	356	10	90	32,040	19.31 g/mi	38	6.8	0.94 g/mi	1.9	0.33	0.75 g/mi	1.5	0.26	0.31 g/mi	0.6	0.11	7.95 g/mi	15.8	2.8	5
TOTAL							89	15.9		23.2	4.13		1.5	0.26		1.7	0.30		466.5	83.0	

- = Not applicable.

Assumes each vehicle makes one round trip to the mine each working day.

Based on 7 days per week for 52 weeks per year minus 9 holidays.

Conservatively assumes normal 164 workers plus 20 new hires, and carpooling at 2 persons per vehicle.

Emission factors for gasoline-fueled light-duty trucks from MVEI7G (1999, 65 mph, 75F). See Appendix A.

Delivery of lime, maintenance supplies, express mail, etc. Emission factors for diesel-fueled heavy-heavy duty trucks (to be conservative) from MVEI7G Emission Factors (1999, 65mph, 75F). See Appendix A.

TABLE 4.1.8-5A
ONSITE FUGITIVE PM_{10} EMISSIONS WITHOUT DRAINAGE CONSTRUCTION (1)
MESQUITE MINE EXPANSION

Source Category	Source Description	No. units	Round-Trip Distance per Unit (miles)	Daily Vehicle Miles Traveled (miles)	Hours Per Day	Uncontrolled Emission Factor	Uncontrolled Emission Rat (lb/day)	Control Technique	Control Efficiency(%)	Controlled Emission Rate Max. Day (lb/day)	Controlled Emission Rate Max. Day (g/sec)	Controlled Emission Rate Annual (g/sec)	Controlled Emission Rate Annual (tons/yr)	Notes
Paved Road: Property line to administration area (Distance = 200 yards).														
	Employee Vehicles	92	0.23	21 vmt/day	24	0.330 lb/vmt	6.9	None	0%	6.90	0.0362	0.0362	1.2	2
	Delivery Vehicles	10	0.23	2 vmt/day	24	0.368 lb/vmt	0.8	None	0%	0.84	0.0044	0.0044	0.15	2
SUBTOTAL - PAVED ROAD EMISSIONS							7.7			7.7	0.041	0.041	1.38	
Unpaved Roads														
	Haul Truck	--	--	4840 vmt/day	24	2.10 lb/vmt	10,147	(3)	80%	2,029	10.7	7.1	240.8	3,4
	Motor Grader	4	4.3	17 vmt/day	24	0.05 lb/vmt	0.90	(3)	80%	0.2	0.0009	0.0009	0.032	3,5
	Service Truck (diesel)	13	6.1	79 vmt/day	24	2.12 lb/vmt	167	(3)	80%	33.4	0.175	0.175	5.9	3,6
	Small-Med. Truck (gasoline)	43	6.1	261 vmt/day	24	1.41 lb/vmt	368	(3)	80%	73.6	0.386	0.386	13.1	3,4
	Medium Truck (diesel)	10	6.1	61 vmt/day	24	2.12 lb/vmt	128	(3)	80%	25.7	0.135	0.135	4.6	3,4
SUBTOTAL - UNPAVED ROAD EMISSIONS							10,810			2,162	11	7.8	264.4	

Source Category	Source Description	Amount	No. units	Activity Intensity	Hours Per Day	Uncontrolled Emission Factor	Uncontrolled Emission Rat (lb/day)	Control Technique	Control Efficiency (%)	Controlled Emission Rate Maximum Day (lb/day)	Controlled Emission Rate Maximum Day (lb/day-acre)	Controlled Emission Rate Maximum Day (g/sec-m^2)	Controlled Emission Rate Annual tons/year	Notes
Miscellaneous														
	Lime loading/unloading	134 tons per day	1	--	24	0.05 lb/ton	6.7	Baghouse and enclosure	90%	0.67	11.7	1.51E-05	0.08	7
	ANFO loading/unloading	28 tons per day	1	--	24	0.02 lb/ton	0.6	Enclosure	99%	0.006	0.097	1.25E-07	0.001	8
	Drilling	60 holes/pit/day	2 pits	21,360 holes/pit/yr	24	0.071 lb/hole	9	Wet drilling, whose efficiency is accounted for in the emission factor.		9	0.7	9.65E-07	1.52	9
	Blasting	1 blast/pit/day	2 pits	150 blasts/pit/yr	24	10.95 lb/blast	22	--	0%	22	1.9	2.48E-06	1.64	10
SUBTOTAL - MISCELLANEOUS EMISSIONS							38			31.1	--	--	3.2	
Disturbed Areas: Drilling, Overburden Loading and Placement, Ore Loading and Placement, and Drainage Construction														
	Shoveling overburden and loading ore	252,809 tons/day	2 dumps/trip	--	24	1.89E-04 lb/ton	95	(3)	80%	19.1	0.4	4.67E-07	1.13	3,11
	Track Dozing	19.44 hours/day	5 dozers	97.2 device-hrs/day		0.87 lb/device-hour	85	(3)	80%	16.9	0.91	1.47E-06	3.01	3,12,13
	Rubber-Tire Dozing	19.44 hours/day	2 dozers	38.9 device-hrs/day		0.87 lb/device-hour	34	(3)	80%	6.8	0.3	4.10E-07	1.20	3,14
SUBTOTAL - DISTURBED AREA EMISSIONS							214			43	--	--	5	
Wind Erosion: Drilling, Overburden Loading and Placement, Ore Loading and Placement, and Drainage Construction Areas														
	Wind Erosion	24 hours/day	52.9 acres	--		3.2 lb/acre-day	167	(3)	80%	33	0.6	8.20E-07	5.96	3,15
SUBTOTAL - WIND EROSION EMISSIONS							167			33	--	--	6	
TOTAL FUGITIVE PM10 EMISSIONS							11,237			2,277	--	--	280	

TABLE 4.1.8-5B
ONSITE FUGITIVE PM_{10} EMISSIONS WITH DRAINAGE CONSTRUCTION (1)
MESQUITE MINE EXPANSION

Source Category	Source Description	No. units	Round-Trip Distance per Unit (miles)	Daily Vehicle Miles Traveled (miles)	Hours Per Day	Uncontrolled Emission Factor	Uncontrolled Emission Rate (lb/day)	Control Technique	Control Efficiency(%)	Controlled Emission Rate Max. Day (lb/day)	Controlled Emission Rate Max. Day (g/sec)	Controlled Emission Rate Annual (g/sec)	Controlled Emission Rate Annual (tons/yr)	Notes
Paved Road: Property line to administration area (Distance = 200 yards).														
	Employee Vehicles	92	0.23	21 vmt/day	24	0.330 lb/vmt	6.9	None	0%	6.90	0.0362	0.0362	1.2	2
	Delivery Vehicles	10	0.23	2 vmt/day	24	0.368 lb/vmt	0.8	None	0%	0.84	0.0044	0.0044	0.15	2
SUBTOTAL - PAVED ROAD EMISSIONS							7.7			7.7	0.041	0.041	1.38	
Unpaved Roads														
	Haul Truck	--	--	7020 vmt/day	24	2.10 lb/vmt	14,717	(3)	80%	2,943	15.5	10.3	349.3	3,4
	Motor Grader	4	4.3	17 vmt/day	24	0.05 lb/vmt	0.90	(3)	80%	0.2	0.0009	0.0009	0.032	3,5
	Service Truck (diesel)	13	6.1	79 vmt/day	24	2.12 lb/vmt	167	(3)	80%	33.4	0.175	0.175	5.9	3,6
	Small-Med. Truck (gasoline)	43	6.1	261 vmt/day	24	1.41 lb/vmt	368	(3)	80%	73.6	0.386	0.386	13.1	3,4
	Medium Truck (diesel)	10	6.1	61 vmt/day	24	2.12 lb/vmt	128	(3)	80%	25.7	0.135	0.135	4.6	3,4
SUBTOTAL - UNPAVED ROAD EMISSIONS							15,381			3,076	16	11.0	372.9	

Source Category	Source Description	Amount	No. units	Activity Intensity	Hours Per Day	Uncontrolled Emission Factor	Uncontrolled Emission Rate (lb/day)	Control Technique	Control Efficiency (%)	Controlled Emission Rate Maximum Day (lb/day)	Controlled Emission Rate Maximum Day (lb/day-acre)	Controlled Emission Rate Maximum Day (g/sec-m^2)	Controlled Emission Rate Annual tons/year	Notes
Miscellaneous														
	Lime loading/unloading	134 tons per day	1	--	24	0.05 lb/ton	6.7	Baghouse and enclosure	90%	0.67	11.7	1.51E-05	0.08	7
	ANFO loading/unloading	28 tons per day	1	--	24	0.02 lb/ton	0.6	Enclosure	99%	0.006	0.097	1.25E-07	0.001	8
	Drilling	60 holes/pit/day	2 pits	21,360 holes/pit/yr	24	0.071 lb/hole	9	Wet drilling, whose efficiency is accounted for in the emission factor.		9	0.7	9.65E-07	1.52	9
	Blasting	1 blasts/pit/day	2 pits	150 blasts/pit/yr	24	10.95 lb/blast	22	--	0%	22	1.9	2.48E-06	1.64	10
SUBTOTAL - MISCELLANEOUS EMISSIONS							38			31.1	--	--	3.2	
Disturbed Areas: Drilling, Overburden Loading and Placement, Ore Loading and Placement, and Drainage Construction														
	Shoveling overburden and loading ore	252,809 tons/day	2 dumps/trip	--	24	1.89E-04 lb/ton	95	(3)	80%	19.1	0.4	4.67E-07	1.13	3,11
	Track Dozing	19.44 hours/day	5 dozers	97.2 device-hrs/day		0.87 lb/device-hour	85	(3)	80%	16.9	0.91	1.47E-06	3.01	3,12,13
	Rubber-Tire Dozing	19.44 hours/day	2 dozers	38.9 device-hrs/day		0.87 lb/device-hour	34	(3)	80%	6.8	0.3	4.10E-07	1.20	3,14
SUBTOTAL - DISTURBED AREA EMISSIONS							214			43	--	--	5	
Wind Erosion: Drilling, Overburden Loading and Placement, Ore Loading and Placement, and Drainage Construction Areas														
	Wind Erosion	24 hours/day	52.9 acres	--		3.2 lb/acre-day	167	(3)	80%	33	0.6	8.20E-07	5.96	3,15
SUBTOTAL - WIND EROSION EMISSIONS							167			33	--	--	6	
TOTAL FUGITIVE PM10 EMISSIONS							15,807			3,191	--	--	389	

4.1.8-5B
WITH DRAINAGE CONSTRUCTION (1)
NE EXPANSION

(g/sec). Construction disturbance and wind erosion fugitive dust is simulated as area sources with emission rates

olution/sq.yd containing 1 part chemical to 5 parts water. The resulting ground inventory of 0.15 gal.
very 45 minutes would be continued to conservatively assure that 80% control efficiency is achieved. Same
e protocol.

million tons by the following factor: 1.5

areas for overburden/interburden and ore. Speed assumed to be 6 mph. Grader use does not increase for maximum

between the maintenance area and the East Rainbow North Overburden/Interburden Storage Area. Use of these trucks does

onary Point and Area Sources, PB86-124906 Part 2 of 2, Chapter 8.10: Concrete Batching, Table 8.10-1, February
mission rate of 10,860 tpy for 1998 production of 24 million tons taken from Newmont Gold Company (1998), and

onary Point and Area Sources, Chapter 8.3: Ammonium Nitrate, Table 8.3-2, July 1993.). Activity area assumed
mpany (1998).

for blasting in each of Rainbow and Big Chief Pits. Holes/pit/day based on wider spacing than in the past.

for drilling in each of Rainbow and Big Chief Pits.

ach pad. Emission factor from SCAQMD, CEQA Air Quality Handbook, Table A9-9-G, November 1993 (See Appendix

rainage construction area.

f the time (according to meteorological data set used in modeling), and 21.9% of total dust is PM10. Emission factor

surface layer. Other protocols developed by the mine or suggested by vendors of chemical dust suppressants could also be used.

The current regular watering program would be continued to assure that the combination of controls would conservatively achieve 80 percent efficiency of removing fugitive PM_{10} from the travel of vehicles on the unpaved haul roads.

4.1.8.4 Measures of Significant Impacts

Determination of level of significance requires that criteria be defined. Significance criteria used in this air quality analysis are presented separately for criteria and noncriteria pollutants.

Criteria Air Pollutants

Criteria pollutant air quality impacts resulting from the Proposed Action would be considered significant if any of the following might occur:

- Violation of CAAQS or NAAQS.
- Substantial contribution to an existing or projected violation of CAAQS or NAAQS.
- Contribution to a delay in attainment of a CAAQS or NAAQS according to an CARB-approved Air Quality Attainment Plan (AQAP).
- Determination that the Proposed Action is inconsistent with CARB-approved AQAP (including visibility protection).

Noncriteria Pollutants

Noncriteria pollutants can potentially cause three types of health risk: carcinogenic, and noncarcinogenic (chronic and acute). Carcinogenic and chronic noncarcinogenic risks are long-term and are based on annual arithmetic mean ambient air quality concentrations, while acute noncarcinogenic risk is short-term, and based on one-hour average concentrations.

A carcinogenic health risk is assumed significant if the probability of noncriteria pollutants causing excess cancer over a lifetime at a receptor site where people reside exceeds one in one hundred thousand (i.e., 10 in 1 million). A chronic or acute risk is assumed significant if the health hazard index for either type risk exceeds 1.0 at a receptor site where people can be exposed. The health hazard index for a non criteria pollutant is defined as the ratio of the maximum offsite concentration, and the reference exposure level. The chronic health hazard index is based on the maximum annual arithmetic mean concentration, and the acute health hazard index is based on the maximum one-hour concentration. The total health hazard index is equal to the sum of the individual pollutant health hazard indices.

The context for health risk in this analysis is the population available for potential health effects and the guidance provided in CAPCOA (1993).

In this remote project location, the three following situations were assumed to represent potential population exposure:

- Exposure of a population of 10 persons at Glamis, approximately 5 miles from the mine. This situation represents a maximum case exposure of recreational populations playing in the sand dunes near Glamis (i.e., the recreationalists would not be subject to long-term continuous exposure).

- Individuals traveling on SR 78 exposed for 6 minutes (3 minutes each direction), 240 days per year for 46 years.

- Fourteen days exposure of campers consisting of four individuals located adjacent to the north or west property boundary. Camping in one location is allowed for only 14 consecutive days, according to BLM regulations.

4.1.8.5 Impacts of Proposed Action

Introduction

The first step in the assessment of potential impacts of the Proposed Action is to determine if the emissions described in the previous section require specific actions under federal, state and district rules and regulations. The Proposed Action was reviewed for applicability of requirements in District Rule 207 (New and Modified Stationary Source Review).

The Proposed Action already complies with NSR BACT requirements as follows:

- Stationary Sources
  - The electric smelting furnace has a baghouse control system.
  - The carbon kiln and boiler burn LPG, a clean fuel.
  - The two lime silos are loaded while using a baghouse control system.
  - The lime silos are unloaded within an enclosure.
  - The ANFO silo is enclosed.

- Fugitive PM_{10} Sources
  - Unpaved roads and disturbed activity areas are watered frequently.

The Proposed Action would not require the acquisition of offsets because the net emission rate increase of each nonattainment pollutant or precursor is less than the applicable threshold of 137 lbs/day. In fact, total emissions (Tables 4.1.8-3 through 4.1.8-5B) will continue to be associated

with a production rate of 60 million tons per year of overburden/interburden and ore. This production rate and its associated emissions were already permitted by the District in 1996.

The Proposed Action would not require issuance of a PSD permit because the stationary source emission rate increase of each attainment pollutant would be less than the threshold of 250 tons per year. Similarly, the Proposed Action would not trigger requirements for a Title V Federal Operating Permit.

The Proposed Action would not require specific actions under the state Air Toxics "Hot Spots" Information and Assessment Act because the permitted emissions of noncriteria pollutants would not change, and hence, recordkeeping and reporting that is already in place would not change.

The CEQA requirement for analysis of air quality impacts is satisfied by the use herein of an appropriate EPA-approved air dispersion model to compute ground-level ambient air quality concentrations at and beyond the facility boundary.

Air Quality Impact Analysis Methodology

The EPA-approved air quality dispersion model used to assess potential impacts on ambient air quality of the Proposed Action is based on a fundamental mathematical description of atmospheric processes in which ground-level ambient air quality concentration at a receptor is related to emission rates from a set of sources. The potentially highest concentration is computed from the maximum scenario emission rates presented in Section 4.1.8.3 and actual meteorological conditions that affect dispersion during each of the 8,760 hours in one year (April 1, 1991-March 31, 1992).

The basic model equation used in this analysis assumes that the concentration of an emitted substance at any location downwind of a point source such as a stack can be determined by a Gaussian distribution about the centerline of the plume from the following equation:

$$C(x,y,z,H) = \left(\frac{Q}{2\pi\sigma_y\sigma_z u}\right) * \left(e^{-1/2\left(y/\sigma_y\right)^2}\right) * \left[\left\{e^{-1/2\left(\frac{z-H}{\sigma_z}\right)^2}\right\} + \left\{e^{-1/2\left(\frac{z+H}{\sigma_z}\right)^2}\right\}\right]$$

where:

$C_{(x,y,z,H)}$ = concentration of a pollutant at the specified position in the atmosphere $[ML^{-3}]$(3)(µg/m³)(4)

Q = pollutant emission rate $[M\ T^{-1}]$ (grams/second)

σ_y, σ_z = transverse and vertical dispersion coefficients, respectively, at downwind distance x [L] (meters)

(3) Brackets [ ] show dimensions of the parameter (e.g., M = mass, L = length, and T = time).

(4) Parentheses ( ) give example units.

u	=	wind speed at the height of the plume centerline [LT^{-1}](m/s)
x,y,z	=	the three-dimensional Cartesian coordinates for downwind, crosswind, and vertical distances from the base of the stack (as shown in Figure 4.1.8-2 [L] (meters)
H	=	height of the plume above the stack base, which is the sum of the height of the stack and the vertical distance that the plume rises due to its momentum and buoyancy [L] (meters)

This fundamental relationship is conservative; hence, Gaussian dispersion models approved by EPA for regulatory use overpredict actual impacts.

The model, Industrial Source Complex, Short-Term Model (ISCST3, Version 99155), is capable of assessing impacts from a variety of sources in regions of simple[5], intermediate[6], and complex terrain.[7] ISCST3 can account for settling and dry deposition of particulate; multiple point, area, line, and volume sources; plume rise as a function of downwind distance; and elevated receptors. The model is capable of estimating concentrations for averaging times ranging from 1 hour to 1 year.

Inputs required by the ISCST3 model include the following:

- Model Options
- Meteorological Data (1 year)
- Source Data
- Receptor Data

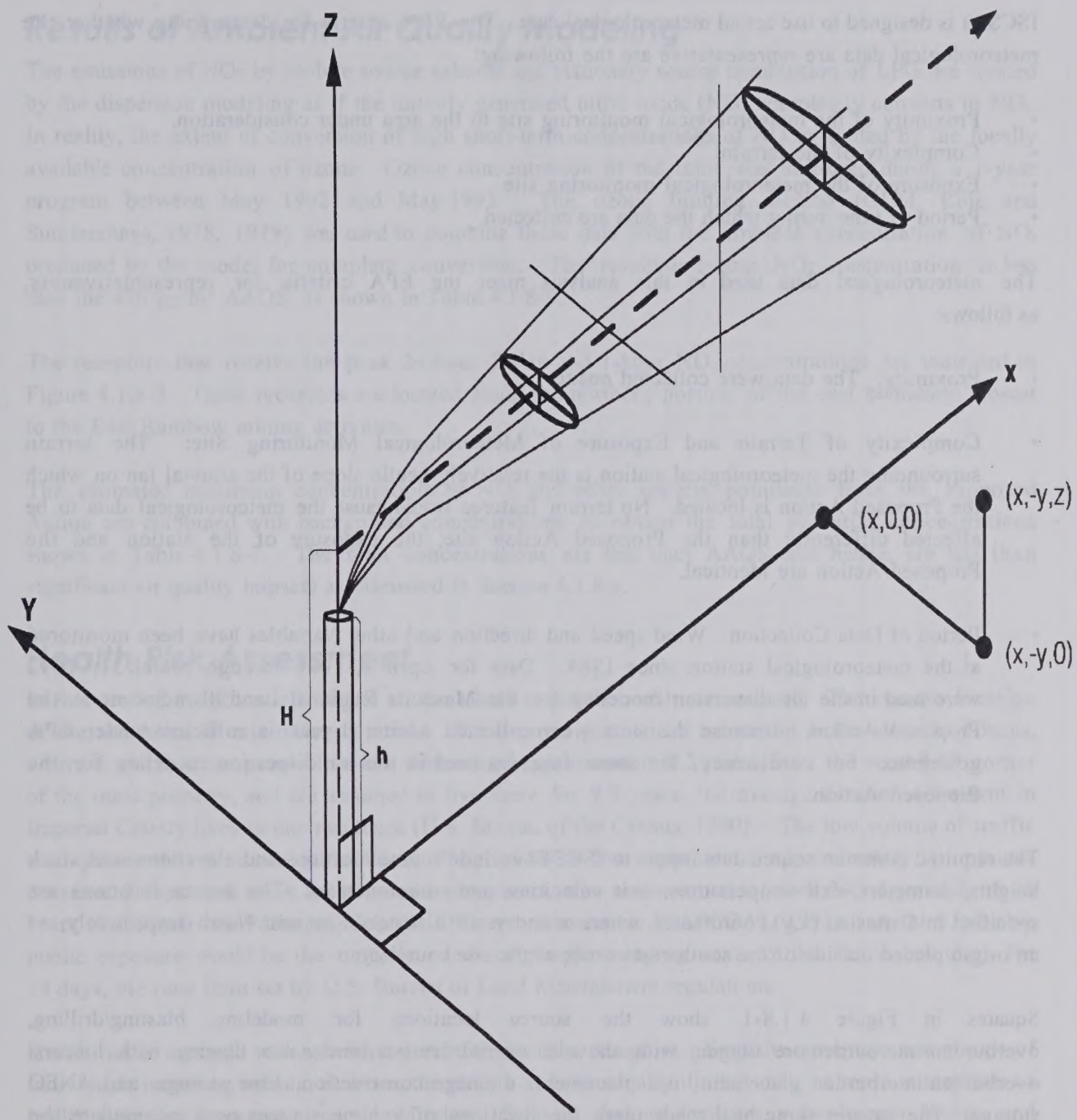
Model options refer to user selections that account for conditions specific to the area being modeled or to the emissions source that needs to be examined. Model options included in this air quality analysis are the following:

- CONC: concentrations are calculated
- RURAL: rural dispersion parameters are used
- MSGPRO: missing data are processed by an EPA routine

The model supplies recommended defaults on all other options. Some defaults must be selected to obtain EPA and District approval of model results. The EPA regulatory defaults are the following:

- Inclusion of stacktip downwash effects.
- Buoyancy-induced dispersion for heated effluent.
- Exclusion of calm meteorological conditions (wind speeds of less than 1 meter per second) from the dispersion calculations.

(5) Simple terrain means that elevations of receptors are below the top of the stacks of point stationary sources.
(6) Intermediate terrain refers to areas where receptor elevations are above stack height and below plume height.
(7) Complex terrain refers to areas where receptor locations are above plume height.



Coordinate system showing Gaussian distributions in the horizontal and vertical

SOURCE: TRC, 2000.

1/3/00

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Gaussian Plume

FIGURE 4.1.8-2

ISCST3 is designed to use actual meteorological data. The EPA criteria for determining whether the meteorological data are representative are the following:

- Proximity of the meteorological monitoring site to the area under consideration.
- Complexity of the terrain.
- Exposure of the meteorological monitoring site.
- Period of time during which the data are collected.

The meteorological data used in this analysis meet the EPA criteria for representativeness, as follows:

- Proximity: The data were collected onsite.

- Complexity of Terrain and Exposure of Meteorological Monitoring Site: The terrain surrounding the meteorological station is the relatively gentle slope of the alluvial fan on which the Proposed Action is located. No terrain features would cause the meteorological data to be affected differently than the Proposed Action site; the exposure of the station and the Proposed Action are identical.

- Period of Data Collection: Wind speed and direction and other variables have been monitored at the meteorological station since 1984. Data for April 1, 1991 through March 31, 1992 were used in the air dispersion modeling for the Mesquite Regional Landfill, adjacent to the Proposed Action. Because the data were collected onsite, 1 year is sufficient under EPA guidelines. For consistency, the same data was used in the air dispersion modeling for the Proposed Action.

The required emission source data inputs to ISCST3 include source locations and elevations, and stack heights, diameters, exit temperatures, exit velocities, and emission rates. The source locations are specified in Cartesian (x,y) coordinates, where x and y are distances East and North respectively, of an origin placed outside of the southwest corner of the site boundary.

Squares in Figure 4.1.8-1 show the source locations for modeling blasting/drilling, overburden/interburden/ore digging with shovels, overburden/interburden/ore digging with loaders, overburden/interburden placement, ore placement, drainage construction, lime storage, and ANFO storage. The squares along haul roads mark the locations of volume sources used to simulate the exhaust from haul trucks, motor graders, and other vehicles.

Two hundred and seventy-five receptors were placed along the entire property line at a spacing of about 100 meters, shown as plus signs in Figure 4.1.8-1. Another set of 418 receptors, shown as labeled dots in Figure 4.1.8-1, form a 20 kilometer square grid with 1 km spacing outside the property boundary. These two sets of receptors, which together total 693, assure that the location of maximum potential offsite air quality impact is identified in the dispersion modeling.

Results of Ambient Air Quality Modeling

The emissions of NO_x by mobile source exhaust and stationary source combustion of LPG are treated by the dispersion modeling as if the initially generated nitric oxide (NO) completely converts to NO_2. In reality, the extent of conversion of high short-term concentrations of NO is limited by the locally available concentration of ozone. Ozone concentration at the mine was measured during a 1-year program between May 1992 and May 1993. The ozone limiting method (OLM, Cole and Summerhays, 1978, 1979) was used to combine these data with the ambient concentration of NO_2 predicted by the model for complete conversion. The resulting 1-hour NO_2 concentration is less than the 470 $\mu g/m^3$ AAQS, as shown in Table 4.1.8-6.

The receptors that receive the peak 24-hour PM_{10} and 1-hour NO_2 concentrations are indicated in Figure 4.1.8-3. These receptors are located along the northern portion of the east boundary, closest to the East Rainbow mining activities.

The estimated maximum concentration of NO_2 and other criteria pollutants from the Proposed Action are combined with background concentrations to obtain the total potential concentrations shown in Table 4.1.8-7. The total concentrations are less than AAQS, and hence, are less than significant air quality impacts as discussed in Section 4.1.8.4.

Health Risk Assessment

In this section the potential risks of air emissions to public health are assessed. The remote location of the site helps to minimize such risks. The nearest permanent habitation is the store at Glamis, where fewer than ten people live at a distance of approximately 4.3 miles from the southwest corner of the mine property, and are assumed to live there for 9.5 years, the average duration a resident in Imperial County lives in one residence (U.S. Bureau of the Census, 1990). The low volume of traffic that passes the mine on State Route 78 provides a low exposure of approximately 6 minutes duration, 5 days each week for non-mine commuters, who are assumed to work 240 days each of 46 years (California Air Pollution Control Officers Association [CAPCOA], 1993). A third possible public exposure would be the unlikely event of people camping next to the fence boundary for 14 days, the time limit set by U.S. Bureau of Land Management regulations.

Health risk is assessed with special concern for sensitive receptors. Sensitive receptors are groups of individuals including infants, children, the elderly and chronically ill, that may be more susceptible to health risks due to exposure to air pollution. Schools, daycare facilities, convalescent homes, and hospitals are of particular concern. The nearest sensitive receptors are at least 25 miles distant in Brawley, Holtville, and other communities in Imperial County.

This section presents the methodology and results of a human health risk assessment performed to assess potential impacts associated with airborne emissions from the construction and operation of the Proposed Action.

Health risk-related emissions to the air consist of criteria and noncriteria combustion byproducts mostly from diesel-fueled combustion, plus minor contributions from LPG-fired boilers and kiln, and

Table 4.1.8-6

NO_x Dispersion And Chemical Conversion By Ozone Limiting Method(1)
Mesquite Mine Expansion

Averaging Period	Concentration From Model(2)	Thermal Concentration(3)	Concentrations With Ozone Limiting Chemistry					Project Concentration ($\mu G/M^3$)(9)(10)	Total Concentration ($\mu G/M^3$)(11)(12)	Ambient Air Quality Standard ($\mu G/M^3$)
	NO_2	NO_2	NO(4)	NO(5)	O_3(6)	NO_2(7)	NO_2(8)	NO_2	NO_2	NO_2
	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	(ppbv)	(ppbv)	(ppbv)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)
1 HOUR	3,083	308.3	1,809.8	1,475.0	37.0	37.0	69.7	378.0	451.4	470

99-116/Tbls&Figs/Section 4.1.8 (3/2/00/cy)

(1) Cole, Henry S. and John E. Summerhays. *The Application of reactive plume models to the estimation of short-term NO_2 concentration*, presentation at the Annual Meeting of the Air Pollution Control Association, Houston, Texas, June 1978; and *A review of techniques available for estimating short-term NO_2 concentrations*, Journal of the Air Pollution Control Association, Volume 29, Number 8, pages 812-817, August 1979.

(2) This concentration is based on all NO emissions converting to NO_2 before reaching receptors. Thermal NO_2 assumed equal to 10 percent of modeled potential maximum NO_2 as recommended in Reference 1.

(3) Thermal NO_2 assumed equal to 10 percent of modeled potential maximum NO_2 as recommended in Reference 1.

(4) Molecular weight of NO (gram/gram-mole) = 30.01. Molecular weight of NO_2 (gram/gram-mole) = 46.01.

(5) Conversion factor for NO ($\mu g/m^3$ to ppbv) = 0.815.

(6) Background O_3 concentration is the annual arithmetic mean measured at Mesquite Mine well field during the 1-year period from May 1992 through May 1993 (ppbv) = 37.

(7) NO_2 concentration is limited to that of O_3 when latter is less than that of NO.

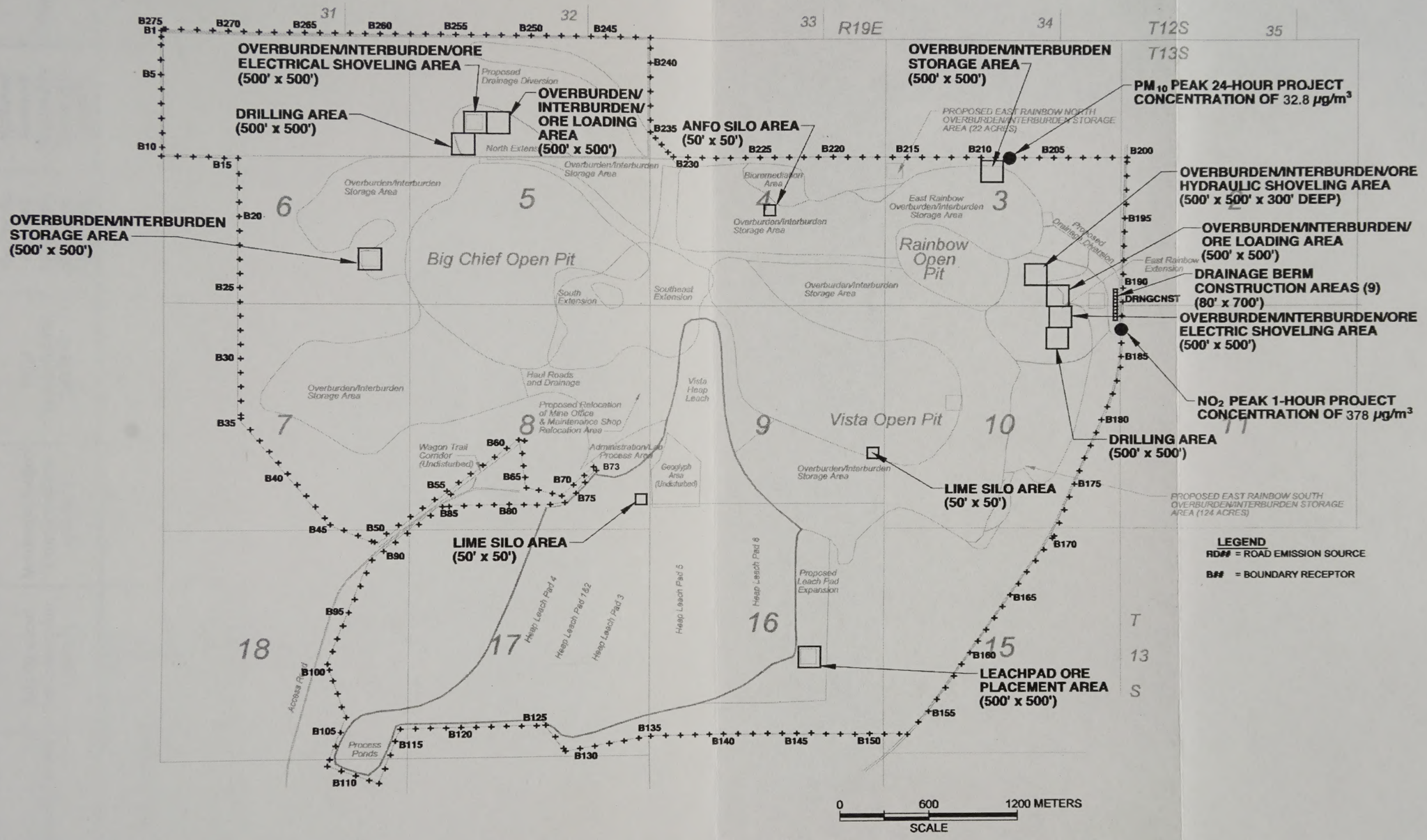
(8) Conversion factor for NO_2 ($\mu g/m^3$ to ppbv) = 0.531.

(9) Project 1-hour NO_2 concentration = thermal NO_2 + chemically-converted NO_2.

(10) Project annual NO_2 concentration = thermal NO_2 + chemically converted NO_2.

(11) Total 1-hour NO_2 concentration = Project 1-hr NO_2 conc. + max. 1-hr background NO_2 = thermal NO_2 + chemically-converted NO_2 + max. 1-hr background NO_2. Most conservative max. 1-hr background NO_2 concentration is the maximum measured at Mesquite Mine well field during the 1-yr period from May 1992 through May 1993 ($\mu g/m^3$) = 73.4.

(12) Total annual NO_2 concentration = thermal NO_2 + chemically converted NO_2 + annual average background NO_2. Annual average background NO_2 concentration is the annual arithmetic mean measured at Mesquite Mine well field during the 1-yr period from May 1992 through May 1993 ($\mu g/m^3$) = 5.6.



SOURCE: TRC, 1999.

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Receptor Locations for Potential Maximum NO_2 and PM_{10} Concentrations

FIGURE 4.1.8-3

Table 4.1.8-7

Maximum Offsite Ground-Level Air Pollutant Concentrations(1)
Mesquite Mine Expansion

Pollutant	Averaging Period	Background Concentration ($\mu G/M^3$)	Maximum Project Concentration ($\mu G/M^3$)	Total Concentration ($\mu G/M^3$)	California Ambient Air Quality Standards ($\mu G/M^3$)	National Ambient Air Quality Standards ($\mu G/M^3$)	Significance
NO_2	1-hour	73.4(2)	378.0(3)	451.4	470	–	Insignificant
	Annual Arithmetic Mean	5.6(4)	10.9	16.5	–	100	Insignificant
SO_2	1-hour	Negligible	288	288	655	–	Insignificant
	3-hour	Negligible	275	275	–	1,300	Insignificant
	24-hour	Negligible	103	103	105	365	Insignificant
	Annual Arithmetic Mean	Negligible	1.1	1.1	–	80	Insignificant
CO	1-hour	Negligible	1,309	1,309	23,000	40,000	Insignificant
	8-hour	Negligible	1,178	1,178	10,000	10,000	Insignificant
PM_{10}	Annual Arithmetic Mean	18.8(5)	2.1	20.9	–	50	Insignificant
	Annual Geometric Mean	14.4(5)	2.1(7)	16.5	30	–	Insignificant
	24-hour	14.4(6)	32.8	47.2	50	150	Insignificant

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-- = None.

(1) Based on emissions from maximum scenario with drainage construction during December and January.

(2) Highest 1-hour concentration measured at Mesquite Mine well field on October 6, 1992, during a sampling program conducted from May 1992 through May 1993.

(3) Ozone limiting method (Cole and Summerhays, 1979) used to calculate $N0_2$ concentration.

(4) Annual arithmetic mean measured at Mesquite Mine well field during the period May 1992 through May 1993.

(5) Based on Mesquite Mine monitoring from 1997 through 1999 (see Table 3.1.8-11 in Section 3.1.8.4.3).

(6) Annual geometric mean is the appropriate background concentration to add to 24-hour maximum project concentration because the latter occurs under low wind speeds of 0.4 to 2.4 mph, while high 24-hour background concentrations occur only with high wind speeds.

(7) This is annual arithmetic mean maximum project PM_{10} concentration because ISCST3 does not calculate geometric mean.

evaporation of volatile compounds from diesel and gasoline storage tanks. After dispersion of these emissions to the ground-level locations of public receptors, inhalation is the main pathway by which emissions of these air pollutants can potentially cause public health impacts. The following other pathways were also evaluated for potential exposure:

- Dermal Absorption
- Soil Ingestion
- Water Ingestion
- Food Ingestion
  - Plants
  - Animal Products
  - Mother's Milk

As discussed below, the potential health risks of the Proposed Action are not significant.

Health Risk-Related Significance Criteria

Public health-related significance criteria were determined based on California Environmental Quality Act (CEQA) Guidelines, Appendix G, Environmental Checklist Form (approved January 1, 1999), and on performance standards and thresholds adopted by responsible agencies. A potential public health impact at the nearest receptor may be considered significant if the Proposed Action results in any of the following:

- Carcinogenic risk of 10^{-5} at any point on the boundary or offsite with application of Toxics-Best Available Control Technology (T-BACT) (SCAQMD, 1999).

- Chronic health hazard index of 1.0 (CAPCOA, 1993).

- Acute health hazard index of 1.0 (CAPCOA, 1993).

These significance criteria are discussed below in more detail for different types of impacts.

The methodology of analyzing public health impact is described below, including the development of an inventory of emissions of noncriteria pollutants, the dispersion modeling of these pollutants, calculation of potential health risks, and their comparison with significance criteria.

Carcinogenic Risk

Carcinogenic risk is the probability or chance of contracting cancer over a human life span, assumed to be 70 years. Any exposure to a carcinogen is assumed to have some probability of causing cancer; the lower the exposure, the lower the risk (i.e., a linear, no-threshold model). A 10-in-one-million risk is used by the SCAQMD, Assembly Bill (AB) 2588 program, and California's Proposition 65 as the threshold for further action (e.g., public notification). This same limit was used by Imperial County as the carcinogenic risk significance criterion in the HRA for the Mesquite Regional Landfill (BLM and the County of Imperial, 1994).

For perspective, the total risk of cancer from all causes in the United States today is about 250,000-in-one-million (or 25 percent), and the total risk of cancer from noncriteria air pollutants in the South Coast Air Basin is about 1,400 in one million (SCAQMD, 1999). Compared to voluntary risks, such as driving, cancer is an involuntary health risk. Environmental and occupational exposures are only a small portion of our involuntary risks. Yet environmental and occupational carcinogens are a principal focus of regulatory policy because exposures to these carcinogens are often involuntary, and, in principle, can be reduced by regulatory initiatives.

Noncarcinogenic Risk

Noncarcinogenic health effects can be either chronic or acute. Chronic toxicity is defined as adverse health effects from prolonged exposure to those noncriteria pollutants that can accumulate in the body. Because accumulation typically occurs slowly, symptoms of chronic effects usually do not appear until long after exposure commences. In determining potential noncarcinogenic health risks from noncriteria pollutants, it is assumed that there is a concentration of each pollutant, the relative exposure level (REL), below which there would be no impact on human health. The lowest no-effect chronic exposure level for a noncarcinogenic noncriteria pollutant is the REL. Below this threshold, the body is capable of eliminating the pollutant rapidly enough to prevent its accumulation.

The chronic health hazard index is defined as the long-term (annual) concentration of the noncriteria pollutant divided by its chronic REL. The health hazard indices for chronic noncriteria pollutants that affect the same organ or system (e.g., respiratory system) are added to obtain the total chronic health hazard index for that organ or system. To be conservative in this health risk assessment, chronic health hazard indices for different organs were summed. The chronic RELs used in the hazard index calculations were those published in CAPCOA (1993). The significance threshold for total chronic health hazard index is 1.0.

Acute toxicity is defined as adverse health effects caused by a brief exposure to a noncriteria pollutant of no more than 24 hours. The air concentration required for a noncriteria pollutant to cause an acute effect is higher than the concentration required to cause a chronic effect because the duration of exposure is shorter. The acute health hazard index for each pollutant is defined as the short-term (e.g., 1-hour) concentration of the noncriteria pollutant divided by its acute REL. Because acute effects are predominantly manifested in one organ or system (i.e., respiratory system), acute health hazard indices for individual pollutants are summed to calculate the total acute health hazard index. The significance threshold for total acute health hazard index is 1.0. Acute RELs were taken from CAPCOA (1993), and updated according to the Office of Environmental Health Hazard Assessment (OEHHA, 1999).

Potential hazards were identified by evaluating noncriteria pollutants that will be emitted to the air, even if in small amounts. Diesel-fueled equipment will be the primary source of potential emissions of noncriteria pollutants. Table 4.1.8-8 presents a list of noncriteria pollutants that may potentially be emitted by the combustion of diesel fuel, gasoline, or LPG and storage of gasoline.

Table 4.1.8-8
Noncriteria Pollutants
Mesquite Mine Expansion

Pollutant	Sources				
	Diesel	Gasoline		LPG Exhaust	Other
	Exhaust	Vapor	Exhaust		
Acetaldehyde	(3)		(2)		
Acrolein	(7)				
Arsenic	(4)				
Benzene	(3)	(2)	(2)		
Chlorobenzene	(2)				
Copper	(4)				
Diesel exhaust particulate	(1)				
Formaldehyde	(3)		(2)	(2)	
Hydrogen Cyanide					(5)
Mercury	(4)				
Naphthalene	(3)				
Nickel	(4)				
Selenium	(4)				
Sodium Hydroxide					(6)
Sulfates				(4)	
Toluene	(3)	(2)	(2)		
Xylene	(3)	(2)	(2)		
Zinc	(4)				

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(1) ARB (1998).
(2) ARB (1991a).
(3) ARB (1999).
(4) ARB (1991b).
(5) Volatilization from leach pads
(6) Emitted from hot caustic used in electrowinning cell.
(7) CATEF 1.2. {TRC}

Diesel exhaust contains many substances, most of which are incorporated in the particulate. The particulate contains metals, polycyclic aromatic hydrocarbons, ammonia, chlorine and sulfates. Together these substances account for the carcinogenic effect of this particulate.

Diesel exhaust also contains volatile constituents, including acetaldehyde, benzene, chlorobenzene, formaldehyde, naphthalene, toluene, and xylene. Except for chlorobenzene and naphthalene, these same volatile constituents are in gasoline exhaust. LPG exhaust contains formaldehyde and sulfates.

The volatile constituents in gasoline vapor include benzene, toluene and xylene.

Sodium hydroxide droplets are assumed to make up the small amount of PM_{10} emitted from the hot caustic used in the electrowinning cell. The concentration of NaOH in these droplets is assumed to be the same 30 percent as in the hot solution.

The small amount of PM_{10} emitted from the electric induction furnace is generated by the heating of sludge containing gold and various other metals. The sludge is pressure washed off the steel wool used in the electrowinning cell where gold and these other metals are removed. Analyses of the solutions going into the electrowinning cell and leaving it allow determination of the relative amount of each metal in the sludge captured on the steel wool, and heated in the induction furnace. Air Quality Appendix A provides the calculation of the composition of PM_{10} emitted by the furnace.

Table 4.1.8-8 includes hydrogen cyanide that is vaporized in small amounts from the leach pads.

Criteria pollutants, discussed in earlier sections, also have potential health impacts, but were analyzed on a different basis. The EPA and CARB established AAQS to prevent adverse public health impacts, including a margin of safety to protect sensitive subgroups of the population. The Proposed Action would cause no significant adverse air quality impacts because expected ground-level concentrations of criteria pollutants are lower than AAQS.

Health Risk Assessment Methodology

The methodology used to assess potential human health risks follows generally-accepted practice as described in CAPCOA (1993). The health risk assessment was conducted in three steps. First, emissions of noncriteria pollutants from proposed sources were estimated. Second, dispersion modeling was used to compute the ground-level concentration of each noncriteria pollutant at defined boundary and offsite grid receptors. Third, carcinogenic unit risk factors and chronic and acute RELs were combined with the estimated concentrations to compute carcinogenic risk, and chronic and acute noncarcinogenic health hazard indices.

A health risk assessment model, ACE2588, was specifically developed by CAPCOA and the County of Santa Barbara (Applied Modeling, Incorporated, 1991) to combine dispersion modeling with health risk parameters (e.g., carcinogenic unit risk factor) to estimate health risks.

Emission Calculation Methodology

Emissions of noncriteria pollutants from the combustion of diesel fuel in internal combustion engines were calculated using emission factors from the California Air Toxics Emission Factor (CATEF) database (Version 1.2; California Air Resources Board [CARB], 1999). The volume of diesel fuel combusted in engines is shown in Tables 4.1.8-2A, 4.1.8-2B and 4.1.8-3, and in Air Quality Appendix A. The mass of gasoline volatilized from its storage tank is shown in Table 4.1.8-3.

One hour and annual emissions of noncriteria pollutants from onsite sources are shown in Table 4.1.8-9 for the maximum scenario described in Sections 4.1.8.2 and 4.1.8.3. The emission rate of hydrogen cyanide (i.e., hydrocyanic acid, HCN) from the leach pads is calculated in detail in Air Quality Appendix A. The calculation is based on the fundamental assumption that the evaporation rate of HCN from the leachpads is proportional to the evaporation rate of water from the solution used to leach the ore in the pads times the ratio of the HCN vapor pressure gradient to the H_2O vapor pressure gradient. The HCN vapor pressure gradient was determined by a field study (Environmental Solutions, Inc., 1991). The 1990 water evaporation rate of 115 million gallons per year was adjusted to 45.4 million gallons per year, estimated to be the maximum to process 25 million tons of ore per year in the Proposed Action. The HCN vapor pressure gradient was reduced to account for the increase in leach solution pH from 9.8 in 1990 to 10.03 in 1999. These adjustments result in an emission rate of 0.46 pounds HCN per hour for the Proposed Action.

One reason the water consumption decreased substantially since 1990 was the cessation of crushing in 1997. Part of the water pumped from the underground aquifer was used on the ore in the crushing circuit. Other parts of the pumped water are used on the leach pads and unpaved roads.

Other reasons that the water consumption rate will be lower during the Proposed Action than in recent years are the following:

- New ore was leached at the same time that old ore was releached during recent years, thus requiring more water.
- Only a limited area, needed for new ore, will be used for leaching during the Proposed Action; and,
- Increased production of ore during the Proposed Action, up from 14 million tons in 1999 to a possible 25 million per year, would be placed on the limited area of leach pads, thereby holding down the amount of water evaporated

The cancer unit risk factors and the chronic and acute RELs were obtained from CAPCOA (1993), CARB (2000) and OEHHA (1999), and are listed in Table 4.1.8-10. The maximum 1-hour emission rate in Table 4.1.8-9 is used to calculate the maximum ground-level concentration for each noncriteria pollutant having an acute REL listed in Table 4.1.8-10. Similarly, the maximum annual emission rate in Table 4.1.8-9 is used to calculate the maximum annual concentration for each noncriteria pollutant having a unit risk factor or chronic REL listed in Table 4.1.8-10.

Table 4.1.8-9
Maximum Scenario Emissions of Noncriteria Pollutants Mesquite Mine Expansion

Noncriteria Pollutant	Emission Rate	
	Hourly (lbs per hour)	Annual (lbs per year)
Acetaldehyde	0.38	2,240
Acrolein	4.5E-03	26.3
Arsenic	3.4E-05	0.30
Benzene	0.227	1,340
Chlorobenzene	9.0E-03	52.9
Copper	9.8E-04	8.6
Diesel exhaust particulate	14.7	86,170
Formaldehyde	1.13	6,630
Hydrogen Cyanide	0.46	4,030
Mercury	1.3E-06	0.012
Naphthalene	1.75E-03	15.3
Nickel	1.8E-04	1.6
Selenium	5.1E-05	0.45
Sodium Hydroxide	0.025	223
Sulfates	6.0E-04	5.5
Toluene	0.23	1,350
Xylene	0.036	214
Zinc	1.0E-05	0.090

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Source: TRC 2000. <TRC>

Table 4.1.8-10

Carcinogenic Unit Risk Factors and Reference Exposure Levels For Noncriteria Pollutants Mesquite Mine Expansion

Noncriteria Pollutant	Carcinogenic Unit Risk Factor(1) $(\mu G/M^3)^{-1}$	Reference Exposure Level (Rel) $(\mu G/M^3)$	
		Chronic(1)	Acute(2)
Acetaldehyde	2.7E-06	9.0	--
Acrolein	2.9E-5	1,300	71
Arsenic	3.3E-03	0.50	0.19
Benzene	2.9E-05	71	1,300
Chlorobenzene	--	70	--
Copper	--	2.4	100
Diesel exhaust particulate	3.0E-04	5 (3)	--
Formaldehyde	6.0E-06	3.6	94
Hydrogen Cyanide	--	70	340
Mercury	--	0.30	1.8
Naphthalene	--	14	--
Nickel	2.6E-04	0.24	6.0
Selenium	--	0.50	--
Sodium Hydroxide	--	4.8	8.0
Sulfates	--	25	120
Toluene	--	200	37,000
Xylenes	--	300	22,000
Zinc	--	35	--

Source: TRC 2000

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-- = None available.
(1) CAPCOA (1993); ARB (2000) for diesel exhaust particulate.
(2) OEHHA (1999a).
(3) OEHHA (1998) <TRC>

HRA Dispersion Modeling Methodology

Noncriteria pollutant emission rates, calculated as described, were combined with other input information (e.g., release height) to run a dispersion model. ISCST3 was again used to compute ground-level concentrations at the receptors shown in Figure 4.1.8-1. The hourly meteorological data used in the model are the same as used in the criteria pollutant analysis discussed above.

The dispersion model computed the maximum hourly and annual arithmetic mean concentrations of each noncriteria pollutant at each receptor. The maximum 1-hour and annual offsite concentrations are listed in Table 4.1.8-11.

Calculation of Health Effects

Carcinogenic risk was computed by multiplying the modeled maximum annual concentration of each noncriteria pollutant in Table 4.1.8-11 by its unit risk factor in Table 4.1.8-10, and summing the resultant risks from all noncriteria pollutants. Chronic and acute health hazard indices were computed by dividing the maximum annual and 1-hour concentrations, respectively, in Table 4.1.8-11 by the chronic and acute RELs in Table 4.1.8-10. The indices for the individual pollutants were summed to obtain total chronic and acute health hazard indices.

The use of EPA-approved dispersion modeling and CAPCOA health risk assessment methodology provides an upper-bound estimate of potential risks. Actual risks would be substantially lower because the carcinogenic unit risk factors are determined from toxicological evidence of effects observed at the lowest concentrations, after which a safety factor of 10 to 1,000 is added.

For the few people who live at the Glamis Beach Store, the assumption was made that they would be continuously exposed to the computed concentrations 24 hours every day for 9.5 years. This period of time was determined by the U.S. Census (2000) in 1990 to be the median duration of a person in his/her residence in Imperial County, California. Use of the median duration for Imperial County is conservative because the Glamis Beach Store is not a regular residence. The store is a business in a remote location, where a few people associated with retail sales live as a convenience. The median residence time in a home in Imperial County is substantially longer than the national average of 7.1 years (National Association of Realtors, 1993).

At the north and west boundary receptors, where the public might conceivably camp outside the fence, maximum potential health risks were adjusted from these same conservative assumptions by the ratio of 14 days to 70 years to obtain risks appropriate to camping on BLM land in compliance with their regulations. The maximum acute health hazard index was set by boundary receptors that lie along the exterior boundary (e.g., B90 in Figure 4.1.8-1), not along the access road that penetrates the property (see B73 in Figure 4.1.8-1).

Table 4.1.8-11

Maximum Scenario Offsite Ground-Level Concentrations of Noncriteria Pollutants Mesquite Mine Expansion

Noncriteria Pollutant	Maximum Offsite Ground-Level Concentration ($\mu G/M^3$)	
	1-Hour	Annual
Acetaldehyde	2.79	0.126
Acrolein	9.69E-5	1.98E-6
Arsenic	1.83E-03	1.52E-05
Benzene	1.63	0.0736
Chlorobenzene	0.0658	2.96E-03
Copper	0.0521	4.33E-04
Diesel exhaust particulate	109	4.82
Formaldehyde	8.25	0.371
Hydrogen Cyanide	0.433	0.0131
Mercury	7.12E-05	5.91E-07
Naphthalene	0.142	9.40E-04
Nickel	9.88E-03	8.19E-05
Selenium	2.74E-03	2.27E-05
Sodium Hydroxide	9.41	4.76E-02
Sulfates	0.102	7.89E-04
Toluene	1.65	0.0743
Xylene	0.263	0.012
Zinc	5.51E-04	4.57E-06

Source: TRC 2000

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Health risks at the south and east boundary receptors along State Route 78 were adjusted from the conservative assumptions by the following ratios:

- 46-year working lifetime/
  70-year total lifetime
- 240 working days per year
  365 total days per year
- 6 commuting minutes (next to mine) per day
  24 total hours per day

HRA Results

The results are presented separately for the potential carcinogenic and noncarcinogenic impacts of the emitted noncriteria pollutants. The potential health effects of criteria pollutant emissions are then discussed relative to ambient air quality standards.

Estimated Carcinogenic Risks

Table 4.1.8-12 presents the maximum offsite carcinogenic risk from the Proposed Action. Compared to the significance criterion of 10^{-5}, the carcinogenic risk of each of the three cases are less than the 10-in-one-million threshold. The location of the maximum risk would potentially occur at Glamis Beach Store as shown in Figure 4.1.8-4. Thus, the Proposed Action poses an insignificant carcinogenic risk according to established regulatory guidelines.

Estimated Noncarcinogenic Risks

Table 4.1.8-12 presents the calculated maximum chronic hazard index, which was predicted to occur at Glamis Beach Store, the same location as the maximum, although insignificant, carcinogenic risk. This computed index is only about 0.06 percent of the significance criterion of 1.0.

Table 4.1.8-12 presents the calculated maximum acute hazard index of 0.20, which was predicted to occur at Boundary Receptor B90 location shown in Figure 4.1.8-4. This location is on the boundary surrounding the access road at the closest point where it is even conceivable that someone might consider camping. This index is one-fifth of the significance criterion of 1.0.

Because the chronic and acute health hazard indices are well below their significance criteria of 1.0, the Proposed Action will have no significant noncarcinogenic health effects.

Criteria Pollutants

Emissions of criteria pollutants from the maximum scenario of mine operation were modeled and evaluated for their impacts on air quality as discussed earlier. Maximum predicted concentrations from the Proposed Action were compared with the AAQS, which are concentration limits that protect the health of the most sensitive individuals, with a margin of safety, and also serve as inhalation RELs. Because modeling of NO_2, CO, SO_2 and PM_{10} indicate that these health-protective

Table 4.1.8-12

Maximum Potential Health Risks
Mesquite Mine Expansion

Receptor	Exposure Conditions	Carcinogenic Risk	Noncarcinogenic Risks	
			Chronic Hazard Index	Acute Hazard Index
Glamis Beach Store	9.5 years exposure [1]	7.4×10^{-6}	0.0006	0.03
North and West Property Boundary	14-Days [2]	8×10^{-7}	0.0006	0.20[3]
Along SR 78	6-Minute Daily Exposure, 240 Days per year for 46 years [4]	3×10^{-6}	0.0002	0.20
Significance Threshold		10^{-5}	1.0	1.0
Significance Level		Insignificant	Insignificant	Insignificant

Source: TRC, 2000

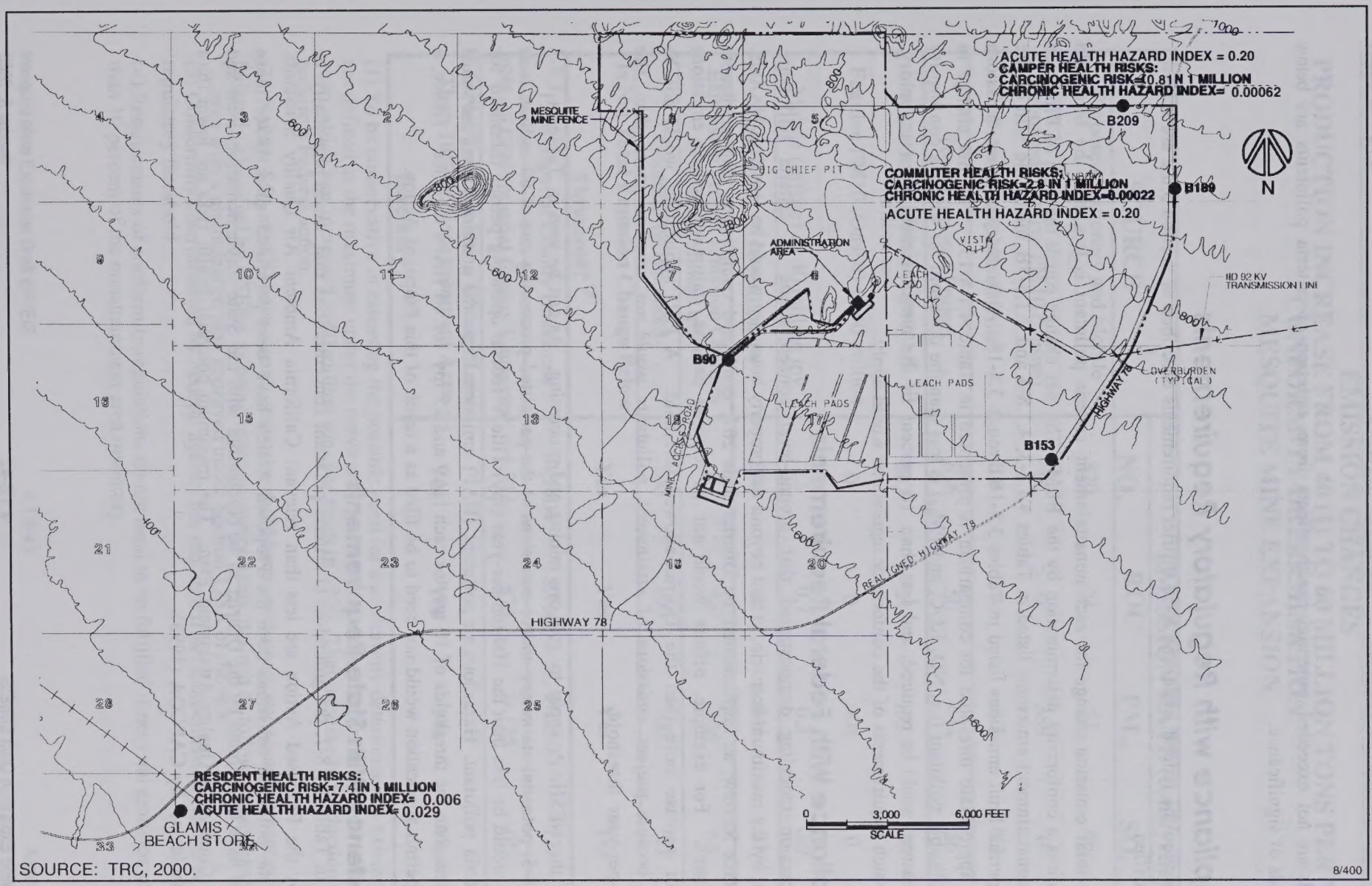
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(1) Carcinogenic risk and noncarcinogenic chronic health hazard index of Glamis Beach Store residents adjusted from 70 years by median duration of a person in current residence (9.5 years in Imperial County according to U.S. Census Bureau [1998]).

(2) Public lands north and west of the Proposed Action that are managed by the U.S. Bureau of Land Management are subject to a 14-day limit.

(3) Maximum acute health hazard index computed for those receptors on west and north boundaries where the public might conceivably camp next to an operating gold mine (i.e., Boundary Receptor B90 versus Receptor B73 in Figure 4.1.8-3).

(4) A commuter takes 3 minutes to round the southeast boundary of the mine when traveling 65 miles per hour on SR 78, hence the daily exposure for both trips between home and work is 6 minutes. A normal work year is 240 days, and the maximum expected owrking life of an individual 46 years.



SOURCE: TRC, 2000.

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Mesquite Mine Expansion EIR/EIS

Receptor Locations for Maximum Potential Health Risks

FIGURE 4.1.8-4

standards are not exceeded, potential health effects from emission of criteria pollutants are below thresholds of significance.

Compliance with Regulatory Requirements

In this section the federal, state, and local district requirements described in Section 3.8.2 are shown to be satisfied.

The net total emission change for each nonattainment criteria pollutant is less than the threshold that requires a conformity determination by the BLM. The net change equals the sum of Proposed Action nonattainment emissions listed in Tables 4.1.8-3, 4.1.8-4 and 4.1.8-5B minus the sum of the current permit limit emissions listed in Tables 3.8-16 through 3.8-18. A summary of these emissions and the appropriate threshold for comparison is presented in Table 4.1.8-13. The net change in each applicable pollutant (i.e. NO_x, ROC, and PM_{10}) is less than the threshold for which a conformity determination would be required, and less than 10 percent of the nonattainment area inventory, above which requirements of the conformity regulations would apply.

Compliance With Federal Requirements

Air dispersion modeling demonstrated that ground-level concentrations of criteria pollutants, produced by the maximum scenario, at and beyond the property boundary would be less than NAAQS. New Source Review, as implemented by District Rule 207, confirmed compliance with applicable requirements. For example, offsets would not be required because stationary source emissions would not increase more than the District-allowed threshold. A PSD application would not be required because project emissions of attainment pollutants would not increase more than the 250-ton-per-year threshold.

None of the NESHAPs apply to gold ore mining and processing. As can be seen in Tables 4.1.8-3 and 4.1.8-5, potential stationary source emissions at the permitted processing rate of 60 million tons per year would be less than the 100-ton-per-year (tpy) Title V federal operating permit threshold for each criteria pollutant. Hazardous air pollutant (HAP) emissions from the stationary sources would also be less than the thresholds of 10 tpy for each HAP and 25 tpy for all HAPs together. Hence, a Title V permit application would not need to be filed as a result of this Proposed Action.

Consistency With State Requirements

As seen in Table 4.1.8-7, the ground-level criteria pollutant concentrations that would potentially be caused by the Proposed Action are less than relevant California Ambient Air Quality Standards. Because the potential emissions from the Proposed Action have been permitted since 1996, these emissions have been found by the District to be compatible with the State Implementation Plan and Imperial County Air Quality Attainment Plan. The maximum potential health risks are lower than the thresholds set by CAPCOA (1993).

TABLE 4.1.8-13
EMISSION CHANGES
PRODUCTION INCREASE FROM 40 (1) TO 60 MILLION TONS PER YEAR
CONFORMITY DETERMINATION
MESQUITE MINE EXPANSION

SOURCE	EMISSION RATE (tons/year)				
	NO_x	ROC	PM_{10}	SO_x	CO
Proposed Stationary and Mobile (Onsite)	820	51	55	86	353
Proposed Fugitive PM10 (Onsite)	0	0	389	0	0
Proposed Mobile (Offsite)	16	4	0.3	0.3	83
Total Proposed Project	836	56	444	86	436
Stationary and Mobile (Onsite) @ 40 million tpy	887	21	32	20	156
Fugitive PM10 (Onsite) @ 40 million tpy	0	0	908	0	0
Mobile (offsite) @ 40 million tpy	13	0.7	0.3	0.9	11
Total Mine @ 40 million tpy	900	22	941	21	167
Expansion Project Emission Changes @ 40 to 60 million tpy	-64	34	-496	65	269
Conformity Threshold	100	100	100	(2)	(2)
Is Net Total Emission Change Below Threshold? (3)	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
1996 Imperial County Emissions	13,140	8,760	91,250	(2)	(2)
10% of 1996 Imperial County Emissions	1,314	876	9,125	(2)	(2)
Is Net Total Emission Change Less Than 10% of Nonattainment Area Inventory? (4)	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**

(1) To be conservative in assessing the possible need for a conformity determination, existing emissions are defined as the maximum under the previously permitted mine production rate of 40 million tons per year, which was increased to 60 million tons per years in 1996. That increase in production rate did not require a Federal action.

(2) Neither SO_2 nor CO have a conformity threshold because they are not nonattainment pollutants, nor federally-classified by USEPA as being in maintenance areas, defined as follows: Maintenance area: "...area with a maintenance plan approved under Section 175A of the Act."

(3) Conformity determination by Federal agency not required if net total emission change is less than regulatory threshold.

(4) Requirements of conformity regulations do not need to be fulfilled if net total emission change is less than 10 percent of the nonattainment area inventory.

Consistency With District Rules and Regulations

The NSR requirements of Rule 207 are satisfied because of the following:

- Potential air quality impacts have been analyzed.
- Ground-level concentrations at and beyond the fence line are below California Ambient Air Quality Standards.
- BACT would be satisfied for each stationary or fugitive dust source.
- Emissions will cause no net increase of nonattainment pollutants in excess of 137 lbs/day, hence offsets will not be needed.
- Health risk assessment demonstrates that noncriteria pollutant air emissions would not cause carcinogenic nor noncarcinogenic health risks to exceed significance criteria.
- A permit to operate already exists for each stationary source at the expanded production rate of 60 million tpy.

The Mesquite Mine has operated and would continue to operate its stationary sources of air emissions in compliance with District prohibitory Rules 400, 401, and 403 through 407.

4.1.8.6 Mitigation Measures

Because PM_{10} is a nonattainment pollutant in Imperial County, special attention was given to fugitive dust control measures. Control measures for the Proposed Action would continue to include the following:

- Wet drilling.
- Use of an enclosure and baghouse for loading and unloading of lime.
- Enhanced watering of unpaved roads, and activity areas (e.g., digging and loading overburden/interburden and ore into haul trucks, placing overburden/interburden on storage areas).
- Continuation of a vigorous mobile equipment maintenance program to assure good working condition and avoid excessive emissions.
- Monitoring of 24-hour PM_{10} concentrations at four perimeter stations to assure that no excessive fugitive PM_{10} travels offsite.

The generation of fugitive PM_{10} on unpaved roads would be reduced by at least 80 percent, using chemical dust suppressants, as shown in this analysis, or other techniques with equivalent effect. Chemical dust suppressants do not need to be repeatedly applied to previously disturbed areas and wind erosion areas as long as mobile equipment is prevented from breaking the crust that tends to form on these soils. The formation of crust is considered equivalent to 80 percent control on such areas. Further, the mine has reseeded over 500 acres to reduce dust generation.

4.1.8.7 Level of Significance After Mitigation

With implementation of the PM_{10} dust control measures described in § 4.1.8.6, the Proposed Action would result in no significant impact to air quality.

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4.1.9 Land Use

4.1.9.1 Assumptions and Assessment Guidelines

This land use impact analysis considers the potential effects of the Proposed Action on existing and planned land uses in the vicinity of the mine site. The Proposed Action's effect on surrounding land uses would be significant if the proposed expansion would be incompatible with existing land uses. The Proposed Action's effect on planned land uses would be considered significant if the proposed expansion would not be in conformance with the applicable land use plans and policies described in Section 3.1.9 of this EIR/EIS. Other potential land use compatibility impacts of the proposed expansion include permanent features of the proposed use, such as aesthetics, noise and traffic, that are analyzed in more detail in Chapter 4 in this EIR/EIS.

4.1.9.2 Impacts of the Proposed Action

The following discussion considers the effects of all proposed and optional facilities on the proposed expansion site, and nearby lands. The use of the existing mine would be in conformance with all adopted plans and policies, and with existing land uses, as described in the Noise, Transportation, and Public Health and Safety sections.

Compatibility with Existing and Surrounding Land Uses

Mesquite Mine

The proposed Mesquite Mine expansion is within a designated mine site, except for the two north half sections that were once part of the Chocolate Mountains Aerial Gunnery Range (CMAGR). The previous EIR found that the mine operation (as implemented) would not create land uses incompatible with surrounding uses. Existing mining and recreation uses were found not to be significantly affected by the Mesquite Mine operation. The Proposed Action would result in an expansion and an extension of existing mining activities on the existing site, which would essentially postpone future non-mining use of the mine pit, overburden disposal areas and the heap leach area. The physical characteristics of remaining primary project facilities would permanently alter the area's value for visually-sensitive recreation activities. Reclamation of the site would mitigate the visual impacts of the mine and therefore, its impact on related recreation activities.

Surrounding Community

The nearest land uses surrounding the Proposed Action site include residential and commercial uses at the Boardmanville and Glamis Beach Store areas, the ISDRA, North Algodones Dunes Wilderness Area and ACEC, and large open space areas used for OHV riding, target shooting, hunting, and prospecting. The mine is located at least three miles from these uses. Due to the distances between the mine and these residential, commercial, and recreational uses, the mine expansion would not be an incompatible land use, and impacts would not be significant.

BLM Public Lands

The mine expansion (Proposed Action) would add approximately 93 acres of federal land that is presently outside the permitted mine areas and managed by the BLM to the mine area. For the mine to be expanded to the north of the existing mine as proposed, BLM agreed in 1996 to exchange state school lands, pursuant to the California Desert Protection Act, for BLM owned lands (the two north half sections) located in the CMAGR. The purpose for this exchange is for their likely mineral value and the potential value of future revenues to the State Teachers Retirement Fund.

The Singer Geoglyphs ACEC is located southeast of the proposed mine expansion site. The area was established by the BLM to protect cultural and historical sites, including the Singer Geoglyphs. The geoglyphs would not be affected by the Proposed Action because all of the cultural resources associated with the ACEC are located south of SR 78, outside of the project boundaries. Because the cultural resources associated with the ACEC are not within the proposed CDCA Plan Amendment Area, the Proposed Action would not impact the resources for which the ACEC was established.

Chocolate Mountains Aerial Gunnery Range

The proposed expansion would be compatible with the CMAGR. Existing uses of the CMAGR include military aircraft training and testing.

During a site visit of the mine, U.S. Marine Corps personnel stated that their only concern with the proposed expansion was the issue of lighting and its potential interference with pilot's NVDs (Night Vision Devices) (Personal Communication, Robert Reilly, October 1999). Potential lighting impacts to the CMAGR are discussed in the Visual Resources section of this EIR/EIS (Section 4.1.11).

Compatibility with Adopted Land Use Plans and Policies

The proposed project site and surrounding areas are governed by several adopted land use plans and policies, including the Imperial County General Plan, Imperial County Zoning Regulations, California Desert Protection Act and the BLM CDCA Plan. The proposal action's conformance with adopted plans and policies is evaluated below.

Imperial County General Plan

Land use planning and development in Imperial County is guided by the County's 1993 General Plan. Each element of the General Plan includes specific goals and objectives to be used as guidelines for implementation of development policies in Imperial County. Those elements of the General Plan that address land use goals and objectives applicable to the Mesquite Mine include the Land Use, Noise, Water, Seismic and Public Safety, and the Conservation and Open Space Elements. The Land Use Element has designated the area for "special purpose facility, government/special public, and recreation/open space" (Imperial County, 1993). As part of an originally approved conditional use permit, mining and processing of mineral, aggregate, or other natural resources is permitted. The Open Space Element has identified the project site as Conservation and Open Space for the managed

production of resources. This category allows for extraction of natural resources such as metals, sand and gravel and clay (Imperial County, 1993).

The following section lists the major objectives identified in the County's Land Use, Seismic and Public Safety, and the Conservation and Open Space Elements that apply to the proposed action, and discusses the Proposed Action's conformance with each objective.

Land Use Objectives

Objective 7.1 of the Land Use element states:

"Provide adequate space and land use classifications to meet current and projected economic needs for extractive activities."

The County General Plan designates the area for special purpose facility, government/special public and recreation/open space. The proposed expansion would be consistent with this designation. As part of the 1996 land exchange under Section 707 of the California Desert Protection Act, the Proposed Action would utilize State-owned parcels (the two north half sections) located in the CMAGR for mineral extraction. The Proposed Action is consistent with this objective.

Objective 7.2 of the Land Use element states:

"Require that extractive uses are designed and operated to avoid air and water quality degradation, including groundwater depletion, other adverse environmental impacts, and comply with the State Surface Mining and Reclamation Act and County Surface Mining Ordinance."

The existing mine currently operates under various permits authorized by County of Imperial, the RWQCB, SMARA and other applicable regulations. The Proposed Action will be held to the same standards as the existing mine, and will continue to meet those standards. Therefore, the Proposed Action would be consistent with this goal.

Noise Element

Objective 1.1 of the Noise Use Element states:

"Adopt noise standards which protect sensitive noise receptors from adverse impact."

Applicable industrial noise regulations provide for adequate protection of employees in the working environment. Newmont is responsible for complying with applicable equipment noise standards and providing employee ear protection devices as required by the Mine Safety and Health Administration (MSHA). As described in Section 4.1.7 (noise), due to the lack of any nearby sensitive receptors and distance from populated areas the mine's, the proposed action would not result in a significant adverse impact to sensitive noise receptors.

Seismic and Public Safety Element

Objective 1.1 of the Seismic and Public Safety Element states:

"Ensure that data on geological hazards is incorporated into the land use review process, and future development process."

The Geology/Soils/Mineral Resources section of this EIR/EIS (Section 4.1.1) discusses the potential for geological hazards to affect the Proposed Action. Tectonic activity is primarily associated with fault systems located 26 or more miles from the Mesquite Mine site, and settlement of the underlying conglomerate is not expected to occur. As discussed in Section 4.1.1, with mitigation no significant geological impacts would occur and Proposed Action would be consistent with this objective.

Objective 1.6 of the Seismic and Public Safety Element states:

"Ensure environmental hazards are considered when siting critical facilities."

The Geology/Soils/Mineral Resources and Environmental Health and Public Safety section of this EIR/EIS (Sections 4.1.1 and 4.1.12, respectively) discusses potential environmental hazards associated with siting and operating a mine at the proposed site. Mitigation measures are identified such that impacts would not be significant. Therefore, the Proposed Action would be consistent with this objective.

Objective 1.7 of the Seismic and Public Safety Element states:

"Require developers to provide information related to geologic and seismic hazards when siting a Proposed Action."

See discussion under Objective 1.6.

Objective 1.9 of the Seismic and Public Safety Element states:

"Encourage the reclamation of lands where mining, irrigation, landfills, solid waste, hazardous materials/waste storage or disposal, and natural soil erosion have occurred."

The proposed reclamation plan is included as an appendix to the proposed POO (Newmont, 1999). The Reclamation Plan would be implemented once the mine is closed, to the satisfaction of BLM, County, EPA and other applicable regulatory agencies. Therefore, with mitigation, the Proposed Action would be consistent with this objective.

Conservation and Open Space Element

Objective 2.3 of the Conservation and Open Space Element states:

"Protect unique, rare, and endangered plants and animals and their habitats."

The Proposed Action would include the transfer of category I or II desert tortoise habitat to BLM as compensation for loss of lower quality category II and III desert tortoise habitat. Also, the Applicant shall allow salvage of appropriate desert vegetation (i.e., barrel cactus) prior to ground disturbance. The Proposed Action could result in a net gain (both in quantity and quality) in federally owned and managed habitat for the threatened desert tortoise, and would be consistent with this objective. Compensation lands would be higher quality Category I or II desert tortoise habitat whereas the proposed action would impact lower quality area is Category II or III desert tortoise habitat. For these reasons, the proposed would be consistent with this objective.

Objective 5.1 of the Conservation and Open Space Element states:

"Encourage the sound extraction of mineral and quarry/aggregate resources while protecting the natural desert environment."

See Objective 5.3 of the Conservation and Open Space Element.

Objective 5.3 of the Conservation and Open Space Element states:

"Require that mineral extraction and reclamation operations be performed in a way that is compatible with surrounding land uses and minimize adverse effects on the environment."

The existing mining operation was previously evaluated for potential land use impacts, and has operated for more than 14 years. The operation has been compatible with surrounding land uses, such as clay mining and recreational uses. The existing mining operation is consistent with the CDCA Plan and the Imperial County General Plan, and operates under the permits issued under the Surface Mining and Reclamation Act (SMARA) and other applicable regulations. As described in Section 4.1.9.2, the proposed expansion would not result in significant, unmitigable environmental impacts to surrounding uses or the environment. For these reasons, the proposed expansion would be consistent with this objective.

Objective 5.4 of the Conservation and Open Space Element states:

"Safeguard the use and full development of all mineral deposits."

The proposed expansion would recover known economically developable mineral deposits onsite. It is important to allow for future recovery of marginal mineral resources onsite should the technology become available or the mineral prices increase. Therefore, the Applicant would not backfill pit

mine areas that contain ore that could be economically feasible to process in the future. The Proposed Action would be consistent with this objective.

Objective 5.5 of the Conservation and Open Space Element states:

"Regulate the development adjacent to or near all mineral deposits and geothermal operations due to the potential for land subsidence."

As described in Section 4.1.1 of this EIR/EIS, subsidence is not expected to occur onsite.

Objective 7.1 of the Conservation and Open Space Element states:

"Encourage the preservation and enhancement of the natural beauty of the desert and mountain landscape."

To enhance the visual compatibility of the mine site with the surrounding terrain, the Applicant proposes to regrade certain sharp corners of OISAs and heap leach pads to reduce visual impacts as part of the proposed Reclamation Plan. As discussed in Section 4.1.11, visual impacts of the proposed expansion would not be significant. Additionally, the provision of compensation lands for desert tortoise mitigation would result in the preservation of the compensation lands providing both biological and visual benefits.

Objective 10.1 of the Conservation and Open Space Element states:

"Ensure that all facilities shall comply with current federal and state requirements for attainment of air quality objectives."

The Air Quality Section of this EIR/EIS (Section 4.1.8) addresses current federal and state requirements for attainment of air quality objectives. This section finds that the Proposed Action would be consistent with the Imperial County Air Quality Attainment Plan and would implement one of the measures identified in the SCAQMP. Therefore, the Proposed Action would be consistent with this objective.

Objective 10.2 of the Conservation and Open Space Element states:

"Recognize the regional significance of the development and conservation of recreational opportunities in Imperial County."

The regional significance of the development and conservation of recreational opportunities in Imperial County are recognized and fully addressed in Section 3.1.10 and 4.1.10 of this EIR/EIS. Section 4.1.10 finds that no significant impacts to recreational resources would occur. Therefore, the Proposed Action would be consistent with this objective.

Objective 10.9 of the Conservation and Open Space Element states:

"Conserve desert lands, within the County's jurisdiction for wildlife protection, recreation, and aesthetic purposes."

See the discussion Objectives 2.3 and 7.1of the Conservation and Open Space Element which describes how the project conserves desert lands for wildlife protection and aesthetic purposes.

The affected recreational lands on-site have no unique or important recreational qualities or features compared to the thousands of acres of neighboring public lands designated for recreation. Therefore, impacts to recreational resources would not be significant, and the project would be consistent with this objective.

Zoning

The County has zoned the project site and surrounding area as S-2 (Open Space/Preservation) M-3, and G/S (Government/Special) with the exception of the area containing the 2,290-acre Mesquite Regional Landfill, which received an approved zone change in March 1997 from the "S" (Open Space) to the "M-3" (Heavy Industrial) Zone. The S-2 Zone classification permits multiple use of the area, consistent with the objectives of the Open Space Element of the Imperial County General Plan (Imperial County, 1993). In the event that a parcel zoned G/S by virtue of the fact that it is under public ownership is sold or otherwise privatized, the zone of the parcel shall be automatically changed to that of S-2 (Title 9 Imperial County Land Use Ordinance Division 5, § 90520.12). Surface mining operations may be permitted in any zone upon the granting of a conditional use permit (ICLUO § 83422). Subsequent approvals relevant to the Proposed Action are listed in Chapter 1, § 1.2.4 (Previous Mine Permits). The proposed expansion is a permitted use under existing zoning and would be consistent with ICLUO. Impacts would not be significant.

California Desert Protection Act

The Proposed Action would result in the extension of the existing Big Chief Open Pit Mine and the construction of a surface-water diversion channel, extending into the two north half sections of the project area. These lands are part of an approved Memorandum of Agreement (MOA) with the BLM to exchange state school lands pursuant to the California Desert Protection Act for BLM owned lands (the two north half sections of the project area) located in the CMAGR. The MOA facilitates a land exchange, which involves the transfer of the two north half sections to the State Lands Commission in exchange for an equal value of SLC's inholdings within the confines of the CDPA boundaries. A mineral assessment would be done in accordance with a previously SLC approved MOA between Department of Interior and the SLC regarding treatment of mineral potential in land exchanges. The purpose of the land exchange is to partially fulfill the requirements of Section 707 of the Desert Protection Act of October 31, 1994, which states that the Secretary of Interior give priority to "lands with mineral interests, including geothermal, which have the potential for commercial development but which are not currently under mineral lease or producing Federal revenues" (Section (b)(2) and (b)(2)(B)).

BLM California Desert Conservation Area Plan

CDCA has designated the Mesquite Mine area as Multiple-Use Class M. This designation provides for balanced use between higher-intensity uses and protection of public lands. This designation allows mining, livestock grazing, energy and utility development, and recreational uses. Management of Class M lands is designed to conserve desert resources and mitigate any damage to those lands caused by permitted uses (BLM, 1980). Its purpose is to provide for concentrated use of lands and resources to meet human needs. The proposed expansion would be consistent with CDCA and class M land designationand impacts would not be significant.

4.1.9.3 Mitigation Measures

As land use impacts from the Proposed Action would not be significant, no mitigation measures are required.

4.1.9.4 Level of Significance After Mitigation

No mitigation would be required, and land use impacts would not be significant.

4.1.10 Recreational Resources

4.1.10.1 Assumptions and Assessment Guidelines

The following impact analysis considers the effects of the Proposed Action on recreational resources in the vicinity of the Mesquite Mine. For this analysis, recreational resource impacts would be considered significant if the Proposed Action would substantially degrade or reduce the quality or quantity of the area available for existing or future recreational opportunities. An unmitigated loss of a unique recreational resource would be a significant impact. Non-conformance with the Wilderness Act of 1964, the California Desert Protection Act (CDPA) or the BLM Interim Management Policy would be a significant impact.

4.1.10.2 Impacts of the Proposed Action

Mesquite Mine Site

The Proposed Action would result in the extension of the existing Big Chief Open Pit Mine and the construction of a surface-water diversion channel, extending into the two north half sections of the project area. These lands are part of an approved Memorandum of Agreement (MOA) with the BLM to exchange state school lands pursuant to the California Desert Protection Act for BLM owned lands (the two north half sections of the project area) located in the Chocolate Mountain Gunnery Range. The MOA facilitates a land exchange, which involves the transfer of the two north half sections to the State Lands Commission in exchange for an equal value of SLC's inholdings within the confines of the CDPA boundaries. A mineral assessment will be done in accordance with a previously SLC approved MOA between Department of Interior and the SLC regarding treatment of mineral potential in land exchanges. The purpose of the land exchange is to partially fulfill the requirements of Section 707 of the Desert Protection Act of October 31, 1994, which states that the Secretary of Interior give priority to "lands with mineral interests, including geothermal, which have the potential for commercial development but which are not currently under mineral lease or producing Federal revenues" (Section (b)(2) and (b)(2)(B)).

The area surrounding the Mesquite Mine is used by approximately 4,000 visitors a year. However, the majority of recreational users counted in this survey used lands located closer to Glamis than to the proposed site.

There are approximately 280,000 acres of BLM Class M and Class I desert lands available for recreation in the CDCA in Imperial County. The Proposed Action would not result in any disturbance of federally-owned land that has not already been committed to mining, and the northern expansion would not result in any loss of BLM Class M nor Class I land available for recreation. Because there would be no loss to designated or planned recreational lands, the Proposed Action would not significantly impact existing or future recreational opportunities.

The Mesquite Mine Overlook Trail was a voluntary project undertaken by the Mine and the BLM. The joint BLM/Gold Fields agreement that created this unique recreational resource allows either

party to "walk away" from the agreement with 30-days notice. The self-guided trail would not be affected by the proposed Mine expansion.

The Proposed Action would introduce additional overburden piles within the Mine site, as described in Section 4.1.11, Visual Resources. The Mesquite Mine Overlook Trail is the only recreational resource provided on-site. This trail is provided specifically for viewing the Mine and related operations. Visual impacts to the Overlook Trail would not be significant because the trail would continue to provide views of the mine.

The mine and associated facilities are located a sufficient distance from the ISDRA that it would not significantly impact recreational uses at the sand dunes. The Mesquite Mine is far enough away that on-site noises would not be heard in the ISDRA or the more heavily used camping areas. Impacts associated with project-related traffic noise on SR 78 would also not be significant.

Wilderness Areas

The wilderness areas identified in Section 3.1.10 are located far enough away from the mine that impacts would not be significant.

4.1.10.3 Mitigation Measures

The Applicant shall implement the mitigation measures described in the Transportation (4.1.6), Noise (4.1.7), and Environmental Health and Public Safety (4.1.12) sections of this EIR/EIS to mitigate impacts to recreational resources.

Mesquite Mine Site

Incorporated by Regulation

There would be no additional mitigation measures required by regulation to mitigate recreational resource impacts besides those described in Sections 4.1.6, 4.1.7, 4.1.8, and 4.1.12.

Incorporated by Project Design

Although the project area does not have a high rating for scenic recreation, reclamation of the site and implementation of visual mitigation measures would partially mitigate the visual intrusion of the project and therefore, its impact on related recreation activities. Mitigation measures incorporated by project design are described in Sections 4.1.6, 4.1.7, 4.1.8, and 4.1.12.

Incorporated to Avoid Potentially Significant Impacts

The above mitigation measures would fully mitigate impacts associated with on-site activities by the Proposed Action to recreational resources. Therefore, additional mitigation would not be required.

4.1.10.4 Level of Significance After Mitigation

Proposed Action impacts to recreational resources would be fully mitigated by the measures described above. With mitigation, impacts would not be significant.

4.1.11 Visual Resources

4.1.11.1 Assumptions and Assessment Guidelines

In order to assess the potential visual impacts of the Proposed Action, existing views of the mine site were photographed from selected viewpoints along SR 78, the closest public roadway from the proposed expansion site. Two of these viewpoints were chosen to represent existing conditions. A reference map providing the location and reference number for both of the viewpoints is shown in Figure 3.11-1. Photo simulations were made representing views to the mine site at completion of the Proposed Action but prior to reclamation. These were then used to assess impacts to existing conditions. The photo-simulations were prepared by BRG Consulting, Inc., using a Computer-Aided Drafting and Design (CADD) system. Information on existing site topography and project development plans was digitized by computer to obtain accurate physical configurations and elevations.

Post-mining, pre-final reclamation views of the mine site are presented in Figure 4.1.11-1 (View Point #1) and in Figure 4.1.11-2 (View Point #2). Both of these views would differ from the post-final reclamation views principally by the more "stepped" slopes and flat tops of the waste rock stockpiles and the heap, and the reduced level of revegetation. These photo simulations have not been used in the analysis of the long-term impacts of the Proposed Action since they show the visual effects at an interim stage and not following the completion of mine reclamation. This is consistent with BLM Visual Manual Section 8400. Long-term impacts will be less than indicated in Figures 4.1.11-1 and 4.1.11-2.

The BLM Visual Resource Management (VRM) System Guidelines (BLM 1986 and 1986) provide a system of analysis to determine the potential visual impacts that would occur with project implementation. The BLM Visual Contrast Rating system is used in this analysis to assess the potential visual impacts of the Proposed Action. The project site is located in a Multiple-Use Class M (Moderate Use) designated area within the CDCA. The objectives of Multiple-Use Class M, based on a controlled balance between higher intensity use and protection of public lands, can be paralleled with VRM Class III as described by the BLM VRM System Guidelines. VRM Class III allows for moderate levels of change to the characteristic landscape. The BLM provides guidelines and worksheets for the VRM system (see VRM, Appendix G). For the purposes of this analysis, a significant impact is defined as project-related change that would be considered substantial in a VRM Class III area as follows:

- A strong degree of contrast (i.e., where the project-related element contrast demands attention, would not be overlooked, and is dominant in the landscape).

- Light and glare conditions that would adversely and substantially affect a sensitive receptor.

4.1.11.2 Impacts of the Proposed Action

The visual effects of an open-pit, heap-leach mine with out-of-pit overburden storage at the Mesquite Mine have been addressed in the following previous environmental documents:

1. *Final Environmental Impact Report/ Environmental Assessment for the Mesquite Project, Imperial County, California* (SCH No. 84040408); prepared for and under the supervision of the BLM and the County of Imperial by The Butler Roach Group, Inc. (now BRG Consulting, Inc.) and St. Clair Research Systems, Inc. dated December 12, 1984.
2. *Final Environmental Impact Report/Environmental Assessment, EA No. CA-067-87-48, for the VCR Mining Project, Imperial County, California* (SCH No. 87052709); prepared for and under the supervision of the BLM and County of Imperial by Environmental Solutions, Inc., dated October 28, 1987.

The visual analyses described in these documents were considered in determining the impacts of the Proposed Action and alternatives.

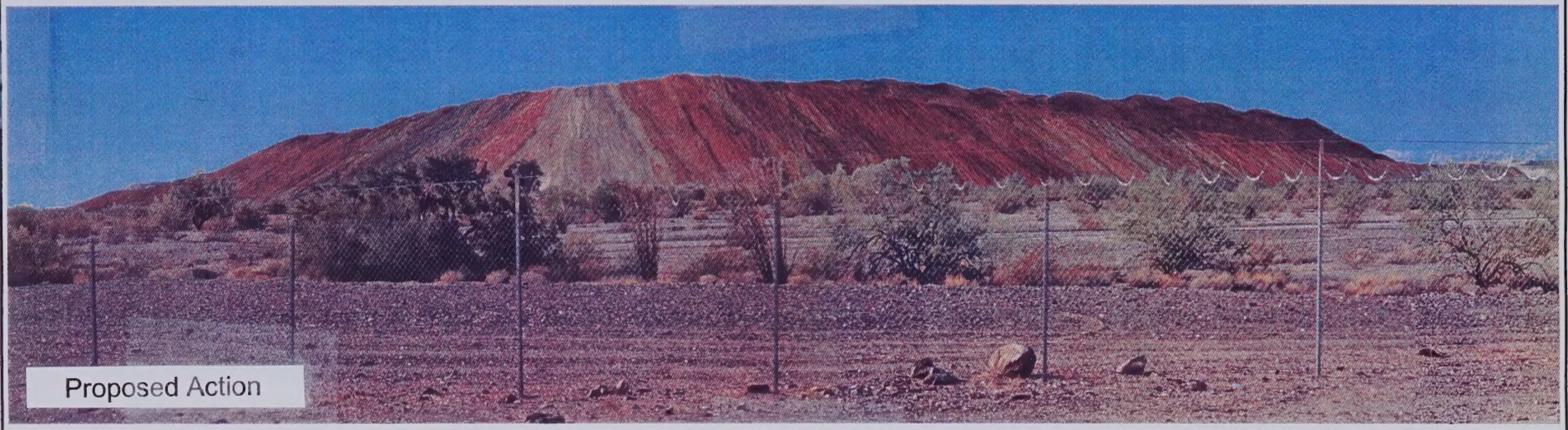
Visibility

The project site could potentially be viewed from far away, such as from within the Imperial Valley by an observer specifically searching for the proposed landform. The significance of these views would be increasingly diminished at such distances because the expanded OISAs would barely be distinguishable from topography resulting from the existing permitted mining operations.

In general, the most obvious visual features of the proposed mine expansion would be the landform alterations. The contoured hill-like form would result in vertical features extending above the horizon line in a view that is generally dominated by horizontally-oriented linear features. The existing flat-topped overburden piles currently extend to heights of approximately 280 feet above existing grade. The resultant form would be that of a large, contoured hill somewhat similar in texture but lighter in color than natural topographic features in the project vicinity (e.g., Brownie Hill).

The visual analysis for this EIR/EIS considers viewers in an area around the site that is bounded to the north by the Chocolate Mountains; bounded to the south by the intersection of Ted Kipf Road and Ogilby Road; bounded to the west by the sand dunes; and bounded to the east by Ogilby Road. Views from farther distances would hardly be changed with implementation of the Proposed Action. For westbound travelers, visibility of the project would begin as far east as the intersection of SR 78 and Ogilby Road. However, unobstructed views to the project site would not occur until westbound travelers are within approximately three miles of the project. Westbound travelers would have potential views of the project site until past the western boundary of the site. For eastbound traffic, visibility would begin at the Osborne Overlook and would continue until passing the eastern boundary of the Proposed Action site.





SOURCE: BRG Consulting, Inc., 2000.

No Scale

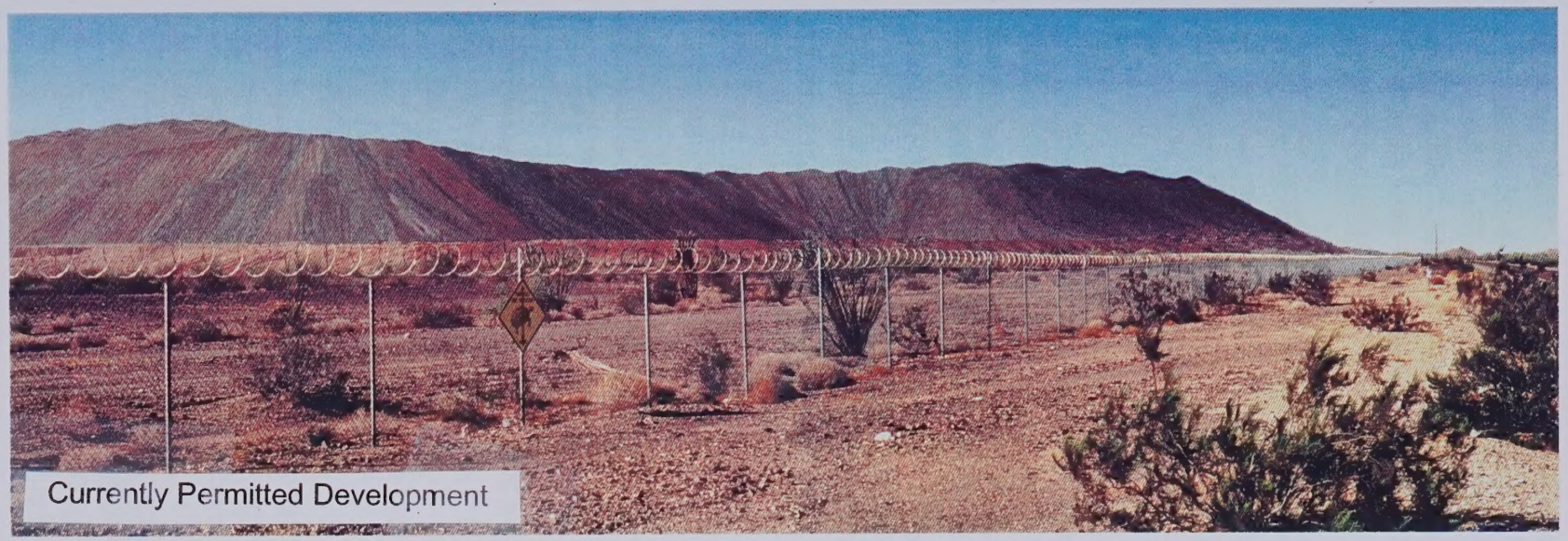
BRG CONSULTING, INC.

Mesquite Mine Expansion EIR/EIS

Visual Simulations of Currently Permitted Development and Proposed Action, View Point No. 1

FIGURE 4.1.11-1

4.1.11-3





SOURCE: BRG Consulting, Inc., 2000.

No Scale

BRG CONSULTING, INC.

Mesquite Mine Expansion EIR/EIS

Visual Simulations of Currently Permitted Development and Proposed Action, View Point No. 2

FIGURE 4.1.11-2

From SR 78, expansion of the overburden and heap-leach piles would be the most prominent topographic change, and would likely impose the most significant effect in both distant and near views of the site. The East Rainbow South OISA would extend approximately eight-tenths of a mile along SR 78, and would be the most visible, in terms of size and as a result of its location immediately adjacent to the west side of the highway right-of-way. This feature would be visible from the north, east, and south.

During the operational phase, facilities and equipment associated with mining operations (e.g., front-end loaders, graders, bulldozers, water trucks, and haul trucks) would also be visible from SR 78. The increase in activity and movement associated with these facilities/equipment would be similar in contrast to existing activities at the site (mining operations and would not strongly contrast with the existing setting.

The proposed diversion channels would be engineered to convey the designed storm events. Views of the diversion channels in the area east of the proposed East Rainbow Extension may also be limited by berms adjacent to the drainage channels. See Figure 2.1-2. Where possible, the channel configuration would be constructed with natural appearing curves, benches, and banks. Surfaces of the banks and benches would then be revegetated to resemble the microphyll woodlands in adjacent washes. The benches would be regraded into microcatchment basins and sown with a seed mix gathered in nearby washes. In addition, small trees, cacti and some shrubs would be transplanted from washes into the expansion areas.

The following discussions assess visual impacts of the proposed expansions at each of the two viewpoints identified in Section 3.1.11. The key visual issue is the degree of visual change anticipated between the existing environment and the views of the Proposed Action.

Viewpoint No.1

The existing middleground and background views from this vantage point include a series of contrasting flat-topped, mine-related heap leach piles and OISAs. The result would be a more gently sloped hillside behind the remaining overburden piles and a small, natural dark-colored hill remaining in middleground views. At this distance (approximately three miles), existing vegetation and landscaping would have little screening effect.

From Viewpoint No. 1, both permitted development and the Proposed Action expansion of heap leach piles would be highly visible, and would markedly contrast with the natural desert landscape. Previous environmental review of the Mine (Environmental Solutions, Inc., 1987) found that the approved heap leach pads and OISAs would not significantly affect visual resources. The overall contrast of the Proposed Action to the Mine development that is already permitted would be incremental (See Figure 4.1.11-1). Therefore, the previous analyses of the visual impacts of the Mesquite Mine applies to the Proposed Action. Consistent with this previous analysis, impacts would not be significant.

Viewpoint No.2

Figure 3.11-2 shows that existing views from the highway into the East Rainbow Pit are extremely limited. Persons in the public right-of-way would be able to see into the mine pit, but would be not able to see across the pit with a view of the upper edge of the north pit wall. In particular, the visual analysis indicates that drivers on SR 78 would not have views into the pit. Such views would be blocked even further by landforms approved under existing Mine permits (Figure 4.1.11-2). Consequently, in terms of public views, the mine pit itself is not considered a significant visual element of the Proposed Action.

The proposed East Rainbow Drainage Diversion Channel would be visible in the immediate foreground, but in the closest possible views, natural-appearing curves, benches, and banks would mitigate its visual impact.

As seen in Figure 4.1.11-2, the proposed East Rainbow South OISA expansion would be highly visible from Viewpoint No. 2. From this close-range vantage point, the OISA would be seen as a more prominent landform relative to the expansive landscape that forms its setting. However, as seen in the upper simulation on this page, Mine development that is already permitted would dominate views from this and other close viewpoints. The permitted OISAs would be highly visible, and would produce a high contrast against the natural desert landscape. As discussed above, the overall contrast of the Proposed Action to the mine development that has already been permitted would be incremental (Figure 4.1.11-2). Therefore, the previous analyses of visual impacts of the Mesquite Mine applies to the Proposed Action. Consistent with the previous analyses, visual impacts would not be significant.

Light and Glare

Night lighting would be provided at the mine to facilitate up to 24-hour operations. The use of night lighting is a concern because of the potential for fugitive illumination to interfere with the visibility of drivers on SR 78, to interfere with Night Vision Devices (NVDs) used during nighttime flight operations at the CMAGR, and to interfere with the recreational experience of users of the ISDRA.

Night lighting is currently being used at the Mesquite Mine, and would continue to be part of the existing environment until the mine is closed, which is anticipated to occur in six years, or longer depending on economics. Lighting levels for the mine would be as required by OSHA, to ensure safe and proper working conditions. All lighting would be directed downward and shielded to minimize fugitive illumination. The use of cut-off fixtures would result in no direct lamp glare in the direction of the highway. Therefore, potential impacts to motorists along SR 78 associated with night lighting at the mine would be below a level of significance.

The area west of the Proposed Action site is heavily used for camping. The area located south of SR 78 and in the vicinity of Glamis is most heavily used. No substantial changes would be made to night lighting at the mine. Thus, the Proposed Action would not be substantially more visible to campers than the existing Mesquite Mine.

Night Vision Devices currently used during U.S. Marine Corps nighttime operational flights at the CMAGR, would potentially be affected by nighttime lighting at the mine site. These devices allow the military to see at night using light at levels much lower than are detectable by the unaided human eye. Nighttime lights which seem normal to the average individual would appear extremely bright through these devices. For safety reasons, the U.S. Marine Corps generally directs its pilots to avoid the Mesquite Mine area when using NVDs. However, some aircraft may still operate in the area from time to time with NVDs. The Mesquite Mine has worked with the Marine Corps to ensure that mine lighting does not pose a hazard to these pilots. Since it began operation in 1984, the Mesquite Mine has had a constructive working relationship with the Marine Corps regarding these issues.

Site Reclamation

Newmont has developed conceptual reclamation configurations for the OISAs that include minor regrading. The configurations have been developed to provide a more aesthetically pleasing landscape, creating a terrain that is conducive to the native surrounding area. The conceptual approach for typical minor regrading of these areas is shown on Plan of Operations (POO, 1999) Figure B.9 (Appendix B).

The present storage areas that are complete and proposed OISAs would have surfaces of mixed rock substrates and course alluvium with little developed soil. The OISAs have two types of upper flat surfaces 1) loose, end-dumped material with hummocky surfaces that result from dumping material without dozing or grading, and 2) hard-packed surfaces as a result of haul truck traffic and dozing. Initial grading in these areas would rip those areas that are hard-packed and form microcatchment basins. Side slopes would be left at an angle of repose. Top surfaces of end-dumped overburden/interburden would be contour-graded into undulating landforms that blend in with the surrounding terrain (see 1999 POO Drawings B.11 and B.12). All surfaces except the faces of the slopes would be broadcast seeded immediately after grading.

Microcatchment areas, shown on 1999 POO Drawings B-8A, B-8B and B-8C, would also be developed on the surfaces of the OISAs. These would enhance water retention, aiding vegetative growth on surfaces of the OISAs, and helping to re-establish a self-supporting and diverse ecosystem. Regrading would also be performed in potential erosion prone areas, to provide additional erosional stability for the reclaimed configuration. Long-term visual impacts from the OISAs and heap leach would be reduced by the proposed reclamation activities. Long-term visual impacts would be in conformance with the VRM Class III Guidelines and would be insignificant.

4.1.11.3 Mitigation Measures

Measures Incorporated by Regulation

There would be no mitigation measures required by regulation.

Measures Incorporated by Project Design

Following completion of Project mining activities, all buildings, equipment, supplies, and debris shall be removed to improve the visual appearance of the Project area.

The applicant shall ensure that project-related lighting is pointed toward the ground and not at sensitive receptors such as drivers on SR 78 and concentrations of campers in the Glamis and Boardmanville areas.

The Applicant shall minimize the presence of reflective material on-site at night that could reflect downward pointed light up or toward sensitive receptors.

The Applicant shall construct the proposed mine expansion so that it resembles a natural landform to the extent practicable. Measures to be incorporated include contouring the tops and sides of the OISAs.

In conformance with the Reclamation Plan as approved by the BLM and Imperial County, all disturbed areas shall be recontoured and reseeded or revegetated with native or indigenous species complementary to vegetation found in the surrounding area.

Mitigation Measures Proposed to Avoid Potentially Significant Impacts

The potentially significant impact of night lighting on NVDs shall be mitigated by directing all new light sources downward. This would preclude light sources that are directed toward military aircraft operating over the Chocolate Mountains.

4.1.11.4 Level of Significance After Mitigation

The potential for impacts to NVDs would not be significant with incorporation of the proposed mitigation.

4.1.12 Potential Environmental Health and Safety Impacts

4.1.12.1 Assumptions and Assessment Guidelines

This section evaluates the potential public health and safety impacts that could be associated with the proposed expansion of the Mesquite Mine (Mine) as described in the Proposed Action. The primary health concern expressed during public scoping meetings was related to management of chemicals that are used during project operations. Specifically requested was a description of controls that will be utilized for mitigating potential off-site exposure. The following discusses this and other health and safety concerns identified at public scoping meetings, which have the potential to impact health and safety of the operational area of the Mine and surrounding environment.

A potential impact is considered significant if it would create a substantial increase in risk to public health or safety. Potential impacts to ground water, transportation and other elements of the human environment are considered in other sections of the EIR/EIS. Reference to those analyses are made, where appropriate, when they also involve issues associated with public health and safety.

4.1.12.2 Impacts Of The Proposed Action

Mining Activities

The process of mining raw ore material involves activities that could generate potential health and safety impacts to the public and Mine employees. Blasting and the use of heavy construction equipment are typical procedures that are utilized during Mine operations. These methods have been utilized by Mine staff since the beginning of mining activities in 1984.

Explosives would be used during mining operations to break and loosen overburden and ore in the mine pits. The overburden and ore is then loaded onto trucks for transport to overburden stockpiles or leach pads, as appropriate.

Potential health and safety impacts to the public and Mine employees resulting from close proximity to blasting activities and heavy construction equipment. Blasting events will occur during daytime hours on a daily basis or as ore production rates mandate.

Given the remote location of the Mine, potential for significant health and safety impacts to the public resulting from mining operations is not expected. The closest residence to the Mine is approximately one mile away. Noise from blasting activities would be the only potential impact to the area surrounding the Mine. Further discussion of noise impacts is provided in Section 4.1.7 of this EIR/EIS.

Measures for mitigating potential health and safety impacts to Mine employees resulting from operational activities were established at the beginning of Mine operations in 1984. Procedures for handling and discharge of explosives are delineated by the Mine Safety and Health Administration (MSHA) and the Newmont safety manual. Explosives are stored in a secured powder magazine constructed and maintained in accordance with Federal and local permit requirements.

Guidelines for operating heavy construction equipment involved in transportation of overburden and ore to storage and agglomeration facilities are set forth in the Newmont safety manual. No significant potential health and safety impacts to Mine employees resulting from mining operations are expected.

Processing Activities

Heap Leaching

The process of heap leaching removes gold from ore. This system consists of heap leach pads, where ore is leached, and solution ponds where the dilute sodium cyanide solution is contained. The heap leach facilities are constructed over an impervious liner, to prevent contamination of ground water. These liners are designed to meet requirements of the Regional Water Quality Control Board (RWQCB), which establishes specific standards on liner permeability. The sodium cyanide solution application system is contained within closed pipes to prevent potential release of the solution. Solution containment ponds are designed to accommodate additional run-off from the heap leach pads and direct precipitation that could result from large rainstorm events.

Application of the dilute sodium cyanide solution is accomplished through drip irrigation. This method of application reduces the potential for airborne introduction of the solution to the surrounding environment. Drip irrigation also reduces the potential for evaporation of the solution once applied to the heap.

The barren solution percolates through the ore, dissolves gold to create a pregnant solution and collects on the impermeable pad at the bottom of the leach pile. The pregnant solution then flows by gravity into collection channels to solution collection ponds. The solution ponds collect the pregnant solution for transfer to the gold recovery plant. After leaching is complete, the heap is rinsed with fresh water to reduce the residual cyanide content to the level stipulated by RWQCB permits.

Approximately 30 acres of the Vista Heap Leach Pad must be rehandled and moved to allow for the southeast extension of Big Chief Pit. These extensions would excavate previously disturbed lands through which the existing stormwater drainage channel passes in the northeast corner of Section 8, T13S, R19E.

Approximately 6,000,000 tons of spent leach ore is currently under the final phase of leaching on the Vista Pad. Following completion of rinsing, formal closure and State of California approvals, the

rinsed ore would either be removed and backfilled into the existing pits, or would be relocated to a lined heap leach facility (Heap Leach Pad 6). The truncated northern limit of the Vista Heap Leach facility would then be rebuilt to provide a containment berm and solution channel similar to the existing facility.

Potential health and safety impacts to the public and Mine employees resulting from the heap leach process exist through exposure to the dilute sodium cyanide solution. Cyanide has been used in various processing methods to extract gold from ore for over 100 years. The technology of using a dilute sodium cyanide solution to heap leach gold from relatively low grades of ore was initially developed in the early 1970s. Commercial applications of the technology started in the late 1970s and have grown rapidly because it is the only economically feasible method to recover gold from disseminated ore bodies where the gold exists at low concentrations.

Consequently, health and safety impacts to the public and Mine employees resulting from the heap leach process are not expected. Although Mine employees work in close proximity to the process solutions, there are no known cases of accident or severe illness directly due to sodium cyanide solution exposure. Guidelines and handling procedures for application and management of the leaching solution are provided in the Newmont safety manual. Federal and state regulations for use of cyanide solution in leaching processes are also enforced by MSHA and RWQCB.

Impervious liners under the heap leach pads, pregnant solution conveyance channels and associated facility components minimize the potential for exposure of the sodium cyanide solution to surface soils. The chosen solution application method will significantly reduce potential for airborne distribution of the sodium cyanide solution. In addition to the facilities engineered for containment, protection of water quality is also provided by the reactivity of cyanide, which results in its volatilization into the atmosphere, its natural degradation to nontoxic carbon and nitrogen compounds and its fixation with the trace metals in the environment to form less toxic complexes over time.

Gold Recovery Process

Pregnant solution is transferred from the solution collection ponds of the heap leaching facilities to the gold recovery facilities. A carbon adsorption process is performed to retrieve gold from the pregnant sodium cyanide solution. Gold is desorbed from the carbon using stripping solution and then pumped to electrowinning cells for formation of the final material that undergoes benefaction.

Solution used in the heap leaching process (i.e., pregnant solution) and gold recovery process (i.e., stripping solution) are recirculated or recycled through their respective processes. Recirculation promotes additional gold recovery and efficient use of the solutions.

As with the heap leach facilities, the gold recovery facilities are constructed over an impervious liner. Liner specifications and design components meet RWQCB requirements for containment of the reagents used for gold recovery. Additional containment features such as dikes and curbs are currently in place to prevent spills from migrating away from the gold recovery area.

Expansion of the gold recovery facilities is not proposed at this time. The current facilities are capable of additional gold recovery functions resulting from the proposed Mine expansion.

Potential health and safety impacts to the public and Mine employees exist through exposure to reagents used in the gold recovery process (i.e., sodium cyanide solution and carbon stripping solutions). As with the processes used in heap leaching, those utilized for the gold recovery process are well established in gold extraction operations. The Mine incorporated these methods as part of daily operational activities at the beginning of operations in 1984.

Potential health and safety impacts to the public and Mine employees as a result of exposure to reagents used in the gold recovery process are not expected. Additions to existing facilities are not proposed as part of the Mine expansion. Design features of the gold recovery facilities and process previously discussed provide mitigation of potential release or exposure. Both the Newmont Consolidated Plan of Operations and safety manual provide internal guidelines and regulations for proper execution of gold recovery. Specific step-by-step instructions for controlling spills are also given in these documents.

Domestic And Industrial Waste

Domestic and industrial wastes generated during Mine operations are disposed in accordance with County and State of California regulations. Domestic and industrial wastes generated by Mine operations include the following:

- paper
- plastic
- food waste
- glass
- metals
- wood
- motor oil
- hydraulic oil
- solvents
- reagents

Potential health and safety impacts to the public and Mine employees could result from improper disposal, handling and management of domestic and industrial wastes listed above.

Impacts to the public and Mine employees resulting from generation of domestic and industrial wastes are not expected. Regulations and guidelines for proper disposal, handling and management of domestic and industrial wastes are set forth by County and State agencies. The Newmont Consolidated Plan of Operations provides internal procedures for generation of domestic and industrial wastes. These regulations and guidelines have been observed by the Mine since operations began in 1984.

Transport Of Chemical Reagents And Explosives

Mining and gold recovery operations at the Mine require the use of select chemical reagents, explosives and fuels. These materials will be stored on site in appropriate facilities. Explosives and chemical reagents require specific storage enclosures and conditions as mandated by OSHA, Cal-OSHA, MSHA and the Newmont Consolidated Plan of Operations and safety manual.

Reagents are used in ore processing activities to recover gold. Reagents are securely stored on site with adequate protection to prevent and contain any accidental spills. Sodium cyanide is the primary reagent used in the leaching process to remove gold from ore mined out of the proposed expanded pits. Lime is added to the ore as it is placed on the leach pad to maintain necessary pH levels in the leach solution (between 10 and 11) to prevent the formation of cyanide gas. A supply of calcium hypochlorite will be maintained on site for detoxification of any accidental cyanide spills. Calcium hypochlorite will be transported to the Mine by road tanker, kept in storage tanks and metered out as needed. Caustic soda is used as needed in the desorption process. Antiscalants are to be used in system facilities to prevent plugging of solution outlets.

The following three general types of explosives are to be used during blasting activities:

- Reagents
- Class A dynamite boosters
- Ammonium nitrate-fuel oil mixture (ANFO)
- Water resistant slurries

Explosives and detonators are stored in two secure magazines on-site. No change in magazine location on procedures would result from the Proposed Action. As previously mentioned explosives storage facilities are constructed according to guidelines provided by OSHA, Cal-OSHA and MSHA.

Potential health and safety impacts to the public and Mine employees could result from improper storage and transportation of the previously mentioned materials.

Impacts to the public and Mine employees resulting from the transportation and storage of chemical reagents and explosives are not expected. Licensed contractors will transport the previously discussed materials to the Mine. Federal and State guidelines for highway transportation of these goods will be observed. Upon reaching the Mine all chemical reagents and explosives will be stored according to OSHA, Cal-OSHA and MSHA guidelines. As an additional safety management measure, emergency response agencies (i.e., fire department and police department) will be provided with a list of materials being transported to the Mine and the routes used by the licensed contractors.

Security and Safety

Security and safety measures would be employed to minimize the risks of accidental or injury to unauthorized or untrained persons. These measures would include:

- Fencing at facilities where activities could endanger employee or public safety, including the mine pits, heap leach pads, solutions ponds and gold recovery facilities.

- Earthen berms at locations to restrict access to mine pits and haul roads by unauthorized vehicles.

- Personnel trained in security on site 24 hours each day.

Newmont provides site security and safety guidelines in its safety manual. Please see this document for a complete description of the guidelines established to mitigate site security and safety impacts.

With continuation of existing security and safety procedures, impacts to the public due to potentially dangerous mining activities are not expected.

Mine Traffic

Mine operations require the use of various pieces of heavy construction equipment. Transportation of ore from the open pit mines to the heap leach gold recovery areas requires the use of haul trucks and other vehicles necessary for operation of the Mine. Haul trucks are capable of transporting 150 tons of mined ore per load and require more operational space than most Mine vehicles.

Potential health and safety impacts to Mine employees and even members of the public who may be present immediately outside the mine fence could result from improper operation of heavy construction equipment. The presence of unauthorized persons within close proximity to operating heavy construction equipment could result in heath and safety impacts to those individuals.

Potential heath and safety impacts to the public and Mine employees resulting from on site traffic are not expected. Vehicular traffic generated during mining, heap leach and gold recovery activities is retained within the boundary of the Mine. Mine employees required to operate vehicles on site are trained in correct operating procedures. The Newmont safety manual provides specific vehicle operating procedures.

Mine Reclamation

Reclamation would occur for decommissioned facilities during ongoing Mine operation, and for remaining facilities following project completion. Safety measures such as restricting access to pit mines, heap leach pad neutralizing and decommissioning, and storage pond neutralizing would be accomplished. Closure will result in the removal of surface structures associated with ancillary facilities. Some access roads may remain following mine closure to provide access for monitoring and for continuing access to Newmont private lands. As discussed in Sec. 2.1.7, the mine area cannot be returned to its original contours. Limited regrading and surface scarification will be used to create and enhance a self-supporting desert ecosystem. Post closure monitoring will assess surface and ground water for closure of heap leach pads, and determine erosion control and revegetation success for reclamation.

Potential health and safety impacts to the public and Mine employees could result from reclamation activities. Improper or inadequate closure and reclamation of the mining, heap leach and gold recovery facilities could result in such impacts.

Potential health and safety impacts to the public and Mine employees resulting from Proposed Action reclamation activities are not expected. Newmont has created a detailed, encompassing site Closure Plan for the Mine. The Closure Plan has been prepared to satisfy requirements of Section 2574, Article 7 of the CCR (Shepherd-Miller, Inc., 1998). A complete Closure Plan can be found in

the Consolidated Plan of Operations. As previously mentioned, the Closure Plan addresses reclamation of the various operational aspects of Mine operations. Concurrent reclamation of the Mine began in 1998 and will continue until closure. Reclamation activities concentrate on those areas that are no longer active.

4.1.12.3 Mitigation Measures

Incorporated by Regulation

The Applicant shall incorporate environmental health and public safety protection measures required by local, State, or federal regulations into the proposed mine expansion, design and operation, specifically, appropriate OSHA and Cal OSHA worker environmental health and public safety regulations and the continuance of established public safety measures and programs existing at the Mine.

Incorporated to Avoid Significant Impacts

Since environmental health and safety impacts will not be significant and will not change from existing conditions at the Mesquite Mine, no mitigation measures to avoid significant impacts are required.

4.1.12.4 Level of Significance After Mitigation

Based upon regulatory requirements and safe operating practices employed at the Mesquite Mine since 1984, no significant impact for health and safety would occur from the Proposed Action.

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4.1.13 Socioeconomics

4.1.13.1 Assumptions and Assessment Guidelines

Socioeconomic impacts derive primarily from changes in the existing makeup of a community. Changes in the age, ethnicity, or income distribution of an area may affect the community either negatively or positively. For the purposes of this EIR/EIS, an adverse significant socioeconomic impact is defined as follows:

- A substantial decrease in employment within the County.
- A substantial decrease in the wage and salary earnings in the County.
- A substantial decrease in the average wage and salary earnings per job in the County.

The following assumptions have been used in completing this socioeconomic analysis:

- It has been demonstrated at the Mesquite Mine that Imperial County workers can provide a reliable workforce for projects in this area.
- No inmigration of new workers is expected.

4.1.13.2 Impacts of the Proposed Action

Employment and Income

The Proposed Action involves developing additional reserves to support ongoing mining operations. The Mesquite Mine would not be modified with the exception of the expansion and extension of mining operations. The project may require an additional 20 to 30 permanent employees. However, no significant increase in the local population is anticipated and no additional demand for housing or associated facilities would occur because the new workers would most likely be drawn from Imperial County's labor pool. Average wages at the mine would not be expected to change substantially; the hiring of 20 to 30 new workers would increase total wages between $0.9 million and $1.35 million per year for a period of six years. Additional employment and income opportunities would be generated by the new reclamation requirements for the proposed mine expansion areas.

Impacts to employment and income would be beneficial.

Government Revenues

Government revenues would be expected to increase from sources such as local sales and property taxes, and from royalties to be paid by the mine. Precious metals mined from the Big Chief Pit Expansion into the northern half sections owned by State Lands Commission (SLC) would generate

royalties in accordance with State Law and the MOU between BLM and SLC regarding the exchange of these lands for BLM-managed lands under the 1994 CDPA. The total amount of government revenues generated would be dependent on the value of the recovered precious metals.

Government agencies would not incur additional obligations from approval of the proposed mine expansion for the following reasons:

- The Applicant is required to provide bonding for closure, post-closure, and reclamation activities.
- The bond will not be released until such time as the success criteria of the reclamation plan have been met.
- The Applicant is required to pay for mandated environmental monitoring activities.
- There is no need for new or expanded government services from the Proposed Action.

Impacts to government revenues would be beneficial.

4.1.13.3 Mitigation Measures

Mitigation Measures Incorporated by Regulation

The Applicant shall, as required by Title 23, CCR, Section 2574(f), prepare an initial estimate of the closure and post-closure maintenance and corrective action costs. A financial surety that is acceptable to the RWQCB shall then be established and maintained.

The Applicant shall pay for all required environmental monitoring activities as provided by law.

No post-closure maintenance or other corrective actions are anticipated to be needed. The closure bond estimate has been prepared, and is incorporated into the Reclamation Plan portion of the POO. The bond will be established prior to disturbance of proposed expansion areas. <Newmont> {response to EPA 4/6/00 #6a, 6b}

Mitigation Measures Incorporated by Design

No design mitigation measures are required.

4.1.13.4 Level of Significance After Mitigation

Implementation of the Proposed Action would result in no significant adverse socioeconomic impacts.

4.1.14 Public Services and Utilities

4.1.14.1 Assumptions and Assessment Guidelines

The following impact analysis considers the effects the Proposed Action would have on the existing Imperial County public services and the currently available utilities at the Mesquite Mine. Public service and utilities impacts would be considered significant if existing or proposed facilities would be insufficient to provide for the needs of the Proposed Action.

4.1.14.2 Impacts of the Proposed Action

Mesquite Mine is a permitted, open functioning mine. The public services and utilities are already in place; therefore, impacts of an expansion would not be considered significant.

Public Services

Mining operations would involve the handling and use of heavy equipment and hazardous materials (e.g., motor oil and gasoline), and create the potential for occasional work-related injuries requiring medical attention. The Applicant currently has procedures that provide employees with a safe workplace. The Applicant provides a security force, fire fighting systems and emergency medical services that adequately meet the requirements of the Proposed Action. As described in Section 4.1.13, Environmental Health and Public Safety, fires would be extinguished using on-site equipment and personnel. Imperial County fire fighting equipment personnel would not be affected.

Additional services would be available in Brawley, about 35 miles west of the site, and could be called upon in unusual emergencies (e.g., ambulance transport services). Consequently, the potential impacts related to availability of police, fire, and medical services would not be significant.

Community Facilities

The Proposed Action is not expected to generate significant population growth, and therefore any significant demand for local community facilities, in the communities in which any Project employees and/or contractors, and their respective families, who may relocate for their job with the mine.

Mesquite Mine employees and their families use the schools, recreational facilities and libraries located within the vicinity of their residences. The mine expansion would potentially create only 20 to 30 new jobs at the site, so there would be no significant increase in the demand for schools, parks, recreational facilities, and libraries.

Utilities

As described in Chapter 2.0 of the EIR/EIS, electricity is the primary source of non-mobile power for the Mesquite Mine. Most power usage is for pumping of water, and nighttime lighting. Other operations and maintenance activities require minor amounts of electricity. Electrical power needs

are obtained from the existing IID 92 kV power line and substation at the Mesquite Mine. Standby generators are available to provide power for essential facilities in the event of power outages.

There are no natural gas lines in the vicinity of the Mesquite Mine. Bottled gas is available from local distributors. Impacts to electric or natural gas supplies or purveyors would not be significant.

Telephone service is currently provided at the Mesquite Mine via an existing microwave station. No underground or overhead wires or cables would be required; therefore, impacts to communication systems would not be significant.

Water uses at the Mesquite Mine include truck washing, dust control and heap leaching. This water would be obtained from the existing Mesquite Mine well field and from any water that flows into the mine pits. A water pipeline currently extends from the well field to the Mesquite Mine. Impacts would not be significant.

Sanitation is handled with septic tanks and leach fields. The septic tanks are pumped periodically to keep the system biologically active and in good working condition. Pumped materials are transported off-site to an appropriate disposal facility. The amount of material pumped each year is negligible compared to the existing disposal capacity in Imperial County. Thus, impacts to sanitation facilities would not be significant.

As described in the Water Resources section of this EIR/EIS (Section 4.1.2), storm water diverted around the mine, and runoff directly from the facility, is directed to the three existing SR 78 wash crossings. Proposed drainage facilities would not increase the risk of downstream flooding or cause flood velocities or volumes that would cause the washout of downstream facilities or infrastructure. Therefore, impacts would not be significant.

4.1.14.3 Mitigation Measures

Incorporated by Regulation

- The Applicant shall supply all MSHA- and Cal MSHA-required training, supplies, and equipment.
- The Applicant shall provide precipitation drainage facilities as described by Section 4.1.2 of this EIR/EIS.

Incorporated Into Project Design

- The Applicant shall provide on-site security, fire protection services, and medical services.

- The Applicant shall construct a six- to eight-foot-high industrial fence, except where existing fencing can be utilized. All proposed expansion areas would be fenced where necessary for security and to avoid unauthorized entry. All new fencing surrounding the proposed mine expansion site would be constructed according to BLM specifications for tortoise fencing. Existing fencing has been improved in places to exclude desert tortoises from entering the Mesquite Mine. The existing fences would be further improved if required to successfully conclude consultation under Section 7 of the Endangered Species Act.

4.1.14.4 Level of Significance After Mitigation

With the implementation of required mitigation measures, impacts would not be significant.

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4.2 REDUCED FOOTPRINT ALTERNATIVE

Mining and processing rates for the Reduced Footprint Alternative would be the same as those for the Proposed Action; and initial and ongoing capital and operating costs would also be similar. The total surface area of disturbance within the Project mine expansion area would be reduced from 693 acres under the Proposed Action to 627 acres (see Table 4.2-1); however, the Project life and the amount of mined material would remain the same. The size of the East Rainbow North and South OISA would be reduced from those under the Proposed Action, while the Big Chief West OISA would be eliminated completely. Like the Proposed Action, the Reduced Footprint Alternative assumes the implementation of all of the environmental protection measures incorporated into the Proposed Action, and assumes that following the completion of mining, all of the same reclamation methods which are listed for the Proposed Action would be undertaken and completed for the Reduced Footprint Alternative.

4.2.1 Geology/Soils/Mineral Resources

The proposed mine expansion site was selected based on the distribution of gold ore as identified in exploratory investigations conducted by the Applicant. Individual facility expansion areas were identified based on structural stability of the rock that forms the pit walls and by the ability to economically mine, haul and process the ore.

Development of the Reduced Footprint Alternative would reduce impacts by 66 acres of undisturbed area to be used for OISAs, 47 of which is new, unpermitted disturbance. Other potential impacts (e.g., erosion) would be the same as those for the Proposed Action, as discussed in Section 4.1.1. With implementation of the mitigation measures described in Section 4.1.1, impacts would not be significant.

The proposed project would not adversely affect valuable economic mineral resources, geothermal or other leaseable mineral resources, nor would it result in significant seismicity impacts (See Section 4.1.1); therefore, the Reduced Footprint Alternative would not avoid or reduce any proposed project impacts associated with these geology issue areas.

During rain events, the proposed project would potentially increase erosion on the manufactured slopes of the OISAs and where the proposed diversion channels would redistribute storm flows into existing down gradient washes. However, these potential impacts could be fully mitigated with standard engineering practices developed by the mine, and construction/operation in accordance with a Stormwater Pollution Prevention Plan as required under the State of California NPDES general permit for stormwater (See Section 4.1). Therefore, the Reduced Footprint Alternative would not avoid any proposed project significant erosion impacts that cannot be fully mitigated with standard construction practices.

Table 4.2-1
Comparison of Areas For Each Proposed Facility, By Major Alternative

Proposed Facilities	Proposed Action			Reduced Footprint Alternative		
	Proposed Area (AC.)	Permitted Disturbance (AC.) (a)	New, Unpermitted Disturbance (Acres)	Proposed Area (AC.)	Permitted Disturbance (Acres) (a)	New, Unpermitted Disturbance (Acres)
Mine Pits						
Big Chief						
North Extension	51.2	0	51.2 (d)	51.2 (d)	0	51.2 (d)
South/Southeast Ext.	171. (b)	NA	NA	171. (b)	NA	NA
Big Chief Subtotal	*222.3*	*0*	*51.2*	*222.3*	*0*	*51.2*
East Rainbow Extension	126.0	100.9	25.1	126.0	100.9	25.1
OISAs						
Big Chief West	21.2	2.6	18.6	-	-	-
East Rainbow North	22.0	22.0	0	5.7	5.7	0
East Rainbow South	132.1	98.8	33.3	103.4	98.8	4.6
Subtotal OISAs	*175.3*	*123.4*	*51.9*	*109.1*	*104.5*	*4.6*
Heap Leach Pad 6	91.6 (c)	91.6(c)	0	91.6(c)	91.6(c)	0
Drainage Diversions						
North Extension	45.3	0	45.3	45.3	0	45.3
East Rainbow	32.8	16.8	16.0	32.8	16.8	16.0
Subtotal Drainage Diversions	*78.1*	*16.8*	*61.3*	*78.1*	*16.8*	*61.3*
TOTALS	**693.3**	**332.7(e)**	**189.5 (e)**	**627.1**	**313.8 (f)**	**142.2 (f)**
TOTALS (requiring biological compensation)	421.6			355.4		

Notes

(a) permitted by BLM, prior to listing of the desert tortoise
(b) biological compensation not required; the area was disturbed prior to the listing of desert tortoise as endangered.
(c) additional biological compensation not required; the area was already compensated for in 1992.
(d) Approximately 12 acres was disturbed during permitted exploration drilling in area north of the existing Big Chief Pit; of that, 9 acres are within the proposed pit extension. 45 acres of compensation are pending; however, no permits have been issued regarding pit excavation.
(e) numbers would total 693.3 if the 171.1 acres of Big Chief South and Southeast had not been purposely excluded.
(f) numbers would total 627.1 if the 171.1 acres of Big Chief South and Southeast had not been purposely excluded.

4.2.2 Water Resources

4.2.2.1 Assumptions and Assessment Guidelines

This section assesses impacts to water resources that could potentially result from the Reduced Footprint Alternative. This assessment also identifies measures that will be taken to comply with state water quality control regulations, and control factors incorporated into the project design, which would reduce potential impacts to below the level of significance. For purposes of this analysis, significance thresholds are as defined in Section 4.1.2.1 of this EIR/EIS.

As discussed in Section 2.1.5, the primary source of water for dust control, ore processing and other needs would be obtained from the existing water supply wells. The rate and quantity of water extraction would remain within the amounts already permitted for the Mesquite Mine, and would be similar to the amounts needed for the Proposed Action. This water withdrawal was analyzed in prior CEQA/NEPA documents for the Mesquite Mine and found to have impacts that are less than significant (Environmental Solutions, Inc., 1987).

Nearly all water-related characteristics of the Reduced Footprint Alternative are the same as those of the Proposed Action, except that the Reduced Footprint Alternative would have 66 fewer acres of new OISA disturbance. This reduces impacts to Waters of the U.S. by approximately 3 acres from that of the Proposed Action.

4.2.2.2 Impacts of the Reduced Footprint Alternative

Surface Water

Certain aspects of mine area construction would have the potential to alter infiltration and runoff. These include surface compaction on site roads, filling of minor drainages, the construction of OISAs, and the capture of direct precipitation in the mine pits. Other than the new leach pad expansion which would capture direct precipitation, new impermeable surfaces (e.g., roofs, asphalt paving) are not proposed. Onsite roads would be constructed with the minimum practical extent of grading. Runoff from most precipitation events would be absorbed or evaporated. During infrequent large storms, there may be increased runoff from road surfaces but there would be no significant increase in runoff from the Mine area because roads would represent only a small fraction of the surface area, and because any increase in runoff from the roads would be offset by capture of direct precipitation in the Mine pits and infiltration into the OISAs. Upgradient diversions would preclude significant capture of runoff by the Mine pits. The OISAs are expected to have a higher than normal infiltration rate because of the porous nature of the material. A net reduction in runoff from the mine area is expected because the expanded Mine pits and OISAs would have reduced runoff and encompass more area than new compacted surfaces such as roads.

The Reduced Footprint Alternative would have smaller areas devoted to out-of-pit storage of overbunden/interburden (compared to the Proposed Action), and thus disturb approximately 66 acres less additional surface area. Other Reduced Footprint Alternative Mine facilities would be identical or

similar to those of the Proposed Action. Thus, the resultant impacts to surface water issues would be similar. Like the Proposed Action, the Reduced Footprint Alternative would require construction of three new drainage diversion channels. However, based on the analysis found in Section 4.1.2, no significant erosion is projected to drainages downgradient from diversions. In addition, a hydrologic/hydraulic evaluation was completed to confirm that flow from the additional watershed area diverted by the North Extension Diversion Channel would not adversely impact SR 78 (Hanson, 1999). These results indicate that the likelihood of a 24-hour storm runoff event overtopping the swale is less than one-in-five-hundred for any given year.

The owner of the Mesquite Landfill project, Arid Operations, Inc., reviewed the plans to determine if the Mine expansion would affect the landfill project. They determined that, based on their preliminary review, the proposed expansion would not significantly affect the landfill drainage design.

Hydrocarbon fuels, ore processing reagents, and other potentially hazardous materials would be stored in aboveground tanks or other appropriate containers at the Mine site. Bulk petroleum products and reagents would be stored within containment areas to prevent uncontrolled releases. There would be the potential for minor hydrocarbon leaks/spills from equipment (e.g., trucks) that would be used for mining operations. Any such spills likely would be small, and easily excavated and removed for subsequent treatment and/or removal from the site.

As with the Proposed Action, the heap leach pad for the Reduced Footprint Alternative would be operated pursuant to WDRs from the RWQCB that would implement appropriate provisions of Title 27. These requirements include criteria for protecting ore processing facilities from run-on and for operating in a manner that protects against release of process fluids or other constituents that may adversely affect surface water quality. With these requirements in place, significant effects to surface water quality are not expected. The Mesquite Mine has operated for 15 years under this regulatory framework, and significant effects to surface water quality have not occurred.

The pit lakes under the Reduced Footprint Alternative would remain isolated from naturally occurring surface water and would have no adverse or beneficial impact to surface water resources. Potential effects of the pit lakes on ground water resources and the chemistry of water expected to occur in the pit lakes are described under the topics of Ground Water Quality and Ground Water Quantity in the following sections.

Waters of the United States

As described in Section 3.2.2.1, surveys were performed to identify "waters of the United States" including wetlands in and around the project area. (Jones & Stokes, August and September, 1999). Locations of delineated waters relative to the Proposed and Alternative expansion areas are shown in Figure 4.1.2-2. According to consultant estimates, the Reduced Footprint Alternative would affect 22.04 acres of Waters of the U.S., compared to 24.97 for the Proposed Action. Approximately 14.84 acres are within areas already permitted for Mine disturbance, while 7.2 acres have no current permits. Totals by expansion area are shown in Table 4.2.2-1.

Table 4.2.2-1

Estimated Waters of the U.S. in Acres, by Expansion Area, Proposed Action and Reduced Footprint Alternative, Mesquite Mine Expansion

Proposed Action	Proposed Action			Reduced Footprint Altern.		
Expansion Area	Prev. Permitted	Not Permitted	TOTAL	Prev. Permitted	Not Permitted	TOTAL
North Extension, Big Chief Pit	0	1.84	1.84	0	1.84	1.84
Big Chief Pit S/SE Extensions (a)	0	0	0	0	0	0
East Rainbow Pit Extension	3.68	0.7	4.38	3.68	0.7	4.38
Big Chief West OISA	0	0	0	0	0	0
East Rainbow North OISA	1.7(b)	0	1.70	0.61	0	0.61
East Rainbow South OISA	8.25	3.48 (b)	11.90	8.25	1.64	9.89
East Rainbow Diversion Channel	2.3	0.24	2.54	2.3	0.24	2.54
North Extension Diversion Channel	0	2.78	2.78	0	2.78	2.78
Heap Leach Pad No. 6 Expansion (c)	NA	NA	NA	NA	NA	NA
TOTALS	**15.93**	**9.04**	**24.97**	**14.84**	**7.20**	**22.04**

Sources: Jones & Stokes, 1999 and 2000; NECI, 2000; BRG Consulting, 2000

(a) The area was previously disturbed by ancillary mining activities
(b) Extrapolated by BRG from Jones & Stokes data
(c) All of Section 16 was previously permitted for heap leach pad disturbance, and compensated

Impacts to Waters of the U.S. by the proposed pit expansions are unavoidable if known ore bodies at the mine site are to be accessed and processed. Surface water drainages must also be diverted around the pits in order to minimize accumulation of water in the pits. The East Rainbow Diversion is located immediately adjacent to the proposed East Rainbow Pit Extension, thus minimizing additional disturbance to Waters of the U.S. It would have been desirable, as well, to keep the North Diversion channel close to the proposed Big Chief North Extension. That, however, would require water to flow uphill in order to connect to the north end of the Vista Diversion channel through the Mine area. The North Diversion channel location that has been proposed allows for gravity flow to the Vista Diversion channel. OISA locations were chosen to minimize haul distances and the amount of additional lands requiring disturbance permits.

As with the Proposed Action, it is proposed that the listed impacts to these waters would be mitigated through the compensation process for desert tortoise habitat. It is anticipated that title to more than 1,200 acres of good tortoise habitat would be conveyed by Newmont to the BLM as compensation for impacts of the Reduced Footprint Alternative. Further provisions of this compensation provide that the lands would include and preserve microphyll woodland at a 3:1 mitigation ratio. Consistent with the Section 404 process, appropriate acreage of Waters of the U.S. would be preserved in this transaction as well. With preservation of Waters within the proposed compensation lands, impacts to Waters of the U.S. would be considered less than significant.

No additional Waters of the U.S. would be dredged or filled as a result of reclamation activities described in Section 2.1.7. Only in the areas disturbed by prior mining activities would the ground surface be prepared and then seeded with native plants. Furthermore, the relationship between planned reclamation measures and mine expansion mitigation measures was reviewed, and no impacts to mine expansion mitigation measures were identified.

Ground Water Quality

Potential impacts to ground water quality at the site could occur in two general ways:

- If sufficient infiltration were to occur, dissolved constituents could be transported downward to ground water.

- Mine pit lakes could impact the quality of water surrounding the pits.

The potential for these impacts to occur is further described in the following subsections.

Infiltration of Dissolved Constituents

Ore that is excavated under the proposed expansion would be processed at heap leach facilities that would be contiguous with existing facilities. Ore processing operations could leak or spill processing fluids if the ore processing facilities are not appropriately designed, constructed and operated. Newmont would be required to construct and operate the leach pad expansion in accordance with CCR Title 27 and WDRs approved by the RWQCB. These regulations and the requirement for WDRs to be issued are designed to

protect water quality. The RWQCB would require routine monitoring and reporting of relevant operational parameters and leak detection systems. With these requirements, significant ground water quality impacts are not expected to occur from ore processing activities related to the proposed expansion. The Mesquite Mine has operated for 15 years under this regulatory framework and impacts to ground water quality have not occurred.

Petroleum products (e.g., fuels, lube oil, hydraulic oil) used to support mining activities could impact ground water if a substantial leak were to occur. Fuel and oil storage already occur at the mine and the expansion would utilize existing facilities. The proposed expansion would not increase the potential for fuel and oil storage to impact ground water, but it would prolong the ongoing use of these products onsite. To mitigate the potential for fuel and oil to impact ground water, bulk petroleum products are stored aboveground in designated areas with appropriate secondary containment for potential spills, and these areas are monitored to assure that leakage is not occurring. With these measures, fuels and oil use at the site are not expected to impact ground water quality.

Precipitation infiltrating through OISAs could carry soluble constituents from the overburden/ interburden if high levels of soluble constituents were to be present, or if overburden/interburden were to have a net acid generating potential. Extensive geochemical testing has been performed on the Mesquite Mine overburden/interburden, as described in Section 3.1.3.4 and the Baker study, 1999. Soluble metals concentrations in these materials are generally low and the material is not acid generating. Because of these characteristics, and because of the low annual precipitation that occurs at the site, the OISAs would not have a significant impact on ground water quality.

Mine Pit Lakes

As discussed in Section 4.1.2, both the Proposed Action and currently permitted mine pits have lakes at their bottoms. The Reduced Footprint Alternative has been evaluated as very similar to the Proposed Action relative to the configuration and character of their pit lakes. Although the Reduced Footprint Alternative accommodates approximately 90 million additional tons of overburden/ interburden into the Mine pits, the materials would be placed off to the side of various pits, above pit lake elevations, and not substantially affect the characteristics of the lakes. Therefore, the pit lake discussion for the Proposed Action found in Section 4.1.2 is also applicable to this Alternative.

Modeling indicates that for the out-of-pit OISA configuration of the Proposed Action and the Reduced Footprint Alternative, there would not be ground water flow-through at the mine pits. The pit lakes would be evaporative sinks, and the ground water flow direction would be toward the pits from all directions. Because the ground water flow would be toward the pits from all directions, the build-up of dissolved constituents in the pit lakes would not affect water quality away from the mine pits.

The impact of the pit lakes on ground water quality would be less than significant because:

- The ultimate pit lake chemistry would not be substantially different under the Reduced Footprint Alternative compared to that which would occur for the currently permitted pits.

- The ground water gradient would be toward the pits from all directions, so the buildup of dissolved constituents would not affect water quality away from the mine pits.

- No current or foreseeable beneficial uses of water would be affected.

Ground Water Quantity

The Reduced Footprint Alternative is very similar to the Proposed Action regarding water quantity. See the discussion in Section 4.1.2. Due to evaporation of water from the mine pit lakes and the relatively low permeability of rock surrounding the mine pits (Table 3.2-3), the pit lake surfaces would equilibrate at an elevation that is lower than the top of the saturated zone as it occurred prior to mining. The inflow to the mine pits during mining and following mining would result in a localized drawdown of ground water surrounding the mine pits. The amount of drawdown would vary with time and distance from each pit. The maximum drawdown adjacent to the mine pits would occur at the cessation of mining, when dewatering ceases. Recovery of the ground water levels surrounding the mine pits would occur as lake levels rise, but evaporation would preclude complete recovery. No measurable ground water level impacts are expected to occur at wells not related to the Mesquite Mine. Other than mine uses, there are no known ground water users in the subbasin. In addition, the low yields characteristic of wells completed in the subbasin (Table 3.2-1) and the poor water quality (Section 3.2.3.4) limit the potential for future beneficial uses to be developed. Due to the lack of ground water users, limitations on foreseeable beneficial uses, and localized nature of drawdown, the impact of drawdown due to the mine pits would be less than significant.

4.2.2.4 Mitigation Measures

Incorporated by Regulation

The Applicant shall incorporate the following water protection features into the proposed construction, operation, and closure of the Reduced Footprint Alternative expansion as required by CCR Title 27 mining regulations administered by the RWQCB:

- Design and construct diversion and drainage facilities to accommodate precipitation conditions associated with the 100-year precipitation event.

- The heap leach pad expansion shall not be located on a Holocene Fault. (No Holocene faults exist onsite).

- The heap leach pad expansion shall be constructed with a low permeability liner system to contain process fluids.

- Containment structures shall be designed by a Registered Civil Engineer, and construction shall be supervised and certified by a Registered Civil Engineer or a Certified Engineering Geologist.

- The heap leach pad expansion shall be operated with monitoring systems to allow detection of potential process fluid leakage in the subsurface.
- The leach pad expansion shall be closed in a manner such that, after closure, it no longer poses a threat to water quality.
- The OISAs shall be closed in a manner that will minimize erosion and the threat of water quality degradation from sedimentation.
- The Applicant shall construct and operate the proposed expansion facilities in accordance with their existing State of California General Permit for Stormwater. These requirements include implementing a Stormwater Pollution Prevention Program incorporating BMPs.
- The Applicant shall preserve Waters of the U.S. per Corps requirements as part of the proposed compensation for loss of desert tortoise habitat.

Incorporated Into the Project Design

The Applicant shall incorporate the following additional water protection features into the proposed landfill design, construction, and operation.

- Design and construct the East Rainbow and Vista diversion channels to discharge flows at approximately the same locations and flow rates that occur presently or which historically occurred prior to the development of the mine diversion system.
- Repair abnormal erosion and take steps to prevent further occurrence in a timely manner during mining and reclamation.
- Store fuels and other bulk liquids with the potential to contaminate ground water in aboveground containers within containment areas.

Incorporated to Avoid Significant Impacts

There would be no potential for significant water resources impacts after mitigation measures required by regulations or incorporated into the project design are implemented. Therefore, no additional mitigation measures are recommended.

4.2.2.5 Level of Significance After Mitigation

With mitigation, impacts would not be significant.

4.2.3 Biological Resources

This section is based on a biological resource report prepared by Nevada Environmental Consultants Inc. (NECI) for the proposed expansion (June, 2000), and on Section 4.1.3 of this EIR/EIS.

4.2.3.1 Assumptions and Assessment Guidelines

The same assumptions and assessment guidelines that were described in Section 4.1.3.1 for the Proposed Project/Action are applicable to the Reduced Footprint Alternative. The only biological difference between the Proposed Project and the Reduced Footprint alternative is that the latter avoids disturbance to approximately 66 acres of lands within the proposed Big Chief West OISA site, the East Rainbow North OISA, and the East Rainbow South OISA.

4.2.3.2 Thresholds of Significance

Based upon NEPA and CEQA guidelines and commonly accepted criteria, an impact would be determined significant if it could:

- Substantially diminish habitat for a plant or animal species.
- Substantially affect a threatened, or endangered, species, special-interest species, or its habitat.
- Interfere substantially with the movement of a resident or migratory wildlife species.

These thresholds are the same as those used to evaluate impacts of the Proposed Action. Biological impacts are not considered significant if the resource is not considered important or sensitive according to the above criteria, or if the extent of impact on the species or its habitat is limited.

4.2.3.3 Impacts of the Reduced Footprint Alternative

The proposed Reduced Footprint Alternative mine expansion is located immediately adjacent to an area that has been heavily affected by mining activities from the existing Mesquite Mine. As detailed in Table 4.2-1, proposed modified facilities total approximately 627 acres. Of this, 171 acres were previously disturbed by prior ancillary activities, leaving a balance of 462 acres. However, only 142 acres of this are unpermitted, while 355 acres comprise uncompensated desert tortoise habitat and are therefore the subject of this analysis. The impacts of these expansions are considered in the discussion of on-site impacts.

Vegetation

The three native plant communities in the project area, desert microphyll woodland, upland succulent and creosote bush scrub, are the habitat types that would be directly impacted (see Figure 3.3-1). The Reduced Project Alternative expansion would result in a direct loss of approximately 335 acres of cresosote/desert pavement habitat, approximately 67 acres of microphyll woodland habitat, and approximately 24 acres of upland succulent habitat. Another 15 acres of microphyll woodland would be cut off from upstream water sources south of the proposed North Diversion Channel. Blue palo verde (*Cercidium floridum*) and desert ironwood (*Olneya tesota*), associated with

these three plant communities would also be impacted. Suitable habitat for ribbed cryptantha and winged cryptantha was observed throughout the proposed project area, though no individuals for these species were observed. Of these three habitat communities, microphyll woodland is considered the most sensitive because it provides potential habitat for several sensitive bird, reptile and mammal species.

Based on the revegetation approach described in Sec. 2.1.7 that utilizes no supplemental irrigation except for transplanted trees or shrubs, no significant problem with growth of invasive exotic plant species in reclaimed areas is anticipated. It is possible that tamarisk trees may persist for some time in areas having high moisture. If this occurs, selective spraying of the tamarisks with an approved herbicide such as Roundup and/or Garlon will be considered, if necessary, subject all applicable regulations and to BLM approval.

Microphyll Woodland

To characterize impacts to this habitat, microphyll woodland was defined as the consisting of one or more individuals of desert ironwood, blue palo verde, and or smoke tree. Within the areas proposed for mine expansion under the Reduced Footprint Alternative, a total of approximately 81 acres of microphyll woodland are present.

Of the approximately 81 acres of proposed impact to microphyll woodland, approximately 23 acres (heap leach pad expansion, Section 16) are already permitted and compensated for in accordance with previous environmental mitigation. Therefore, the proposed action will result in a net impact of approximately 58 acres of microphyll woodland (43 acres direct impact, 15 acres indirect). Impacts to this 58 acres of unpermitted microphyll woodland habitat would be significant. Table 4.2.3-1 shows impacts to microphyll woodland for each proposed expansion areas.

Microphyll woodland is considered by CDFG to be one indicator of CDFG jurisdictional streambeds under Section 1600 of the Fish and Game Code. The other indicator on-site is desert washes, which are considered jurisdictional waters by the U. S. Army Corps of Engineers (See Section 3.2, Water). The total area of CDFG jurisdictional streambeds (microphyll woodland + desert washes less the overlap) within the unpermitted expansion areas is approximately 23.4 acres, while there are approximately 37.8 acres in areas previously permitted for Mine disturbance. Figure 4.1.2-3 shows the proposed Plan of Operations boundary and mapped microphyll woodland areas and waters of the U.S. Table 4.2.3-2 details CDFG jurisdictional components by expansion area.

The vegetated areas that would be disturbed by the project represent a very small percentage of similar vegetation communities that occur in the project vicinity and in the Colorado Desert as a whole. As such, the project area is not considered a significant portion of the available plant community. Undisturbed adjacent areas throughout the region provide similar habitat for plant species. Because the proposed project would be located in plant communities that are widely distributed, it would not significantly reduce the overall species diversity or population of any plant species within the Colorado Desert.

Table 4.2.3-1
Reduced Footprint Alternative
Impacts to Microphyll Woodland

Proposed Expansion Area	Impacts to Microphyll Woodland (Acres)	
	Direct	**Indirect**
North Extension	8.03 acres	0.00 acres
North Drainage Diversion	6.53 acres	*15.32 acres cut off from upstream water due to diversion
East Rainbow North Overburden/Interburden	0.00 acres	0.00
East Rainbow Drainage Diversion	6.50 acres	0.00
East Rainbow Extension	8.63 acres	0.00
East Rainbow South Overburden/Interburden	12.0 acres	0.00
Leach Expansion	(22.9 acres*)	0.00
Total Impact	**64.59 acres**	**15.32**
Total Direct and Indirect Impacts	**79.91 acres**	
Acreage not compensated for	41.69 acres	15.32
Total acreage not compensated for	**57.01 acres**	

Source: NECI, 2000

*22.9 acres in Section 16 have previously been permitted and similar lands have been provided in compensation

Blue palo verde and desert ironwood would also incur impacts from the Proposed Action. These plants are classified as regulated state plants and are protected by state law. However, this law was designed to regulate harvest of plants for nursery and other purposes and does not apply to land clearing or other development activities (CDFG, 1993). Individual plants that are suitable for transplantation will be removed and transplanted prior to surface disturbance; as described in Section 2.1.7. Therefore, impacts would not be significant.

Based upon the types of vegetation communities and species represented, and the location of the project site in the context of the Colorado Desert, proposed activities at the mine would not result in significant impacts to: (1) vegetative communities restricted in distribution, (2) core habitats, or (3) buffer zones. However, the loss of 81 acres of microphyll woodland from the proposed expansion would reduce available habitat for protected or sensitive desert species, most notably resident and migrant bird species and mule deer.

Wildlife

Construction would affect the habitat of many common species of desert animals that are found in this region, as well as a few sensitive or protected species that use the area. Resident reptiles, including the desert tortoise, would be displaced from the site. On-site habitat would be lost or reduced for resident birds. On-site unpermitted and uncompensated microphyll woodland habitat (58 acres) used by wintering and migrating birds for cover, forage, and nesting sites would be lost or reduced. The loss of habitat for migrant birds in the lower Colorado River Valley has created a need to maintain peripheral habitats for bird breeding and wintering. The habitat in the project area is a small part of a large but lesser-quality, bird-breeding and wintering habitat resource provided by the Colorado Desert. Because vegetation in the project area is sparse and the surrounding area is virtually undeveloped and has similar habitat, the loss of 58 acres of microphyll woodland habitat as a bird-breeding and wintering area would not be considered a significant impact.

Mammals, such as the mule deer (*Odocoileus hemionus*) and Nelson's bighorn sheep (*Ovis canadensis*) visit the site to browse. The proposed mine expansion would decrease available foraging area for these mammal species on a regional basis. However, the surrounding area is virtually undeveloped and would not be affected by the proposed mine expansion. Therefore, there would be no overall effect on the ecological systems that support mammals that are indigenous to the area and impacts would not be significant. Smaller mammals, reptiles, and amphibians (i.e. wildlife with small home ranges and reduced mobility) would be affected the most due to their inability to relocate off site. Because these species are regionally abundant, their displacement would not significantly impact the regional ecosystem.

Equipment operation and human presence would be expected to further affect wildlife. Direct mortality could occur to resident animals in burrows or nests destroyed by heavy equipment. Animals that would move (or be moved) off the site could indirectly affect animals in adjoining habitat by inducing temporary population stress. Daily operations could impact species sensitive to high noise levels. Noise and the presence of humans associated with project operations may discourage the

presence of the larger mammals such as the mule deer and bighorn sheep, as well as the larger predators such as the coyote (*Canis latrans*).

Surface disturbances and habitat loss as a result of project construction would not be expected to significantly affect wildlife populations due to the availability of adjacent large habitat areas. In addition, compensation lands primarily provided to offset loss of desert tortoise habitat, would also benefit other species.

The proposed expansion would not be expected to significantly interrupt wildlife movement patterns or result in additional habitat fragmentation (the local habitat is already fragmented by the existing Mesquite Mine and SR 78) because wildlife would be able to move around the proposed project area to get to the other side. The project site is not known to provide significant habitat for animal species of restricted distribution, or to provide core habitat for any species. Impacts would not be significant.

Ecological Risk Assessment

An ecological risk assessment was conducted by Samuel Bamberg and Shepherd-Miller, Inc. (2000) relative to current and predicted future pit lake water quality at the Mesquite Mine site. The two proposed alternatives examined were that of open pits (the Proposed Project/Action or Reduced Footprint Alternative) or that of total backfill, where all the new overburden/interburden would be placed in the pits (the IOISA Option Alternative). Risks from the Reduced Footprint Alternative were evaluated as equivalent to those from the Proposed Project/Action. Detailed discussion of the issues and analysis are provided in Section 4.1.3.3. The results are summarized below.

In summary, four COCs (boron, selenium, silver and fluoride) present potential future risk to site receptors from the drinking water exposure pathway, particularly with the total backfill option. However, due to predicted high salinity of the lakes as a result of evaporation, only limited use of the waters for drinking is expected. The more critical potential exposure pathway is through dietary exposure from vegetation that could colonize the edges of the lakes.

Since the principal route of exposure and potential risk to site biota is through the dietary pathway, limiting the development of vegetation within the pit lake basins would minimize the potential for risk, since it would largely preclude uptake of COCs into vegetation, and thus the subsequent transfers to site receptors. In addition, preventing the development of any substantial vegetation communities along the pit lake edges would also reduce the available habitat for terrestrial biota, further limiting the risk potential. An effective mitigation of potential risk could be accomplished by constructing the pits such that the pit walls at, immediately above, and immediately below the permanent water line are too steep to allow for successful colonization of plants.

Threatened and Endangered Species

This section discusses impacts to the desert tortoise, the only federal or state listed endangered or threatened wildlife species observed or expected to occur on-site. There are no federal or state listed endangered or threatened plant species observed or expected to occur on-site.

Desert Tortoise (USFWS: Threatened; CDFG: Threatened; BLM Sensitive Species)

Desert Tortoise surveys were conducted on April 14-16, 1999 and June 1, 2000 within all of the proposed expansion areas (See Section 3.3). Based on the field surveys, a total of 4 tortoises, 8 pallets and 59 burrows were observed throughout the proposed expansion areas (See Figure 3.3-2).

Another survey was conducted on April 16 and September 2, 1999 along SR 78, where it runs adjacent to and parallel with the mine property line, indicated no signs of tortoises, whether individuals or signs of burrowing under the fence, were observed during the surveys. The majority of the fence has a protective berm of soil heaped along the inside, which appears to serve as a deterrent to burrowing. Also, no sensitive plant species were observed during the survey. During the interim months, no signs of tortoise fatalities or activity were observed along this section of SR 78 by NECI or Mesquite Mine personnel. However, an adult tortoise has been repeatedly sighted by mine personnel in the area of the proposed North Extension. This individual was not observed during the tortoise surveys but may still be utilizing this area as part of its home range.

Approximately 627 acres of desert tortoise habitat (BLM Category II and III) will be disturbed as a result of the proposed expansion. The loss of this 627 acres of potential habitat from the proposed mine expansion would represent a significant direct impact on the desert tortoise. However, approximately 272 acres are currently compensated for, or were disturbed prior to the listing of the desert tortoise. All of the acres in Section 16 are permitted and have been compensated for under Biological Opinion (1-6-92-F-22). Therefore all of the acreage in Section 16 have already been compensated for and no additional impacts are anticipated. A total of 355.4 acres of impacts to tortoise have not been compensated, and would be new impacts associated with implementation of the Proposed Project/Action. Biologists from NECI conducted tortoise surveys on all of the proposed expansion areas utilizing methodologies currently acceptable to USFWS. The results of the Tortoise Surveys of April 14 -16 1999 and June 1, 2000 are found in the NECI Biological Report (2000).

Impacts to desert tortoises and desert tortoise habitat on the property are considered to be low since population density is low; however, some "take" may occur from the loss of potential habitat. Because the desert tortoise is a Federally threatened, as well as state listed species, any potential take would require consultation with USFWS under Section 7 of the Federal Endangered Species Act, and contact with CDFG under CESA.

Mitigation measures typically require relocating desert tortoises inhabiting impact zones. Secondary impacts to the relocated tortoises could occur as a result of potential stresses associated with

relocation (mostly, but not limited to, lack of knowledge of cover sites, nest sites, and foraging areas). Established tortoises in the recipient population could potentially be affected by competition for foraging land and increased antagonistic social interactions. The degree to which these factors would occur and affect the success of relocation are not well understood. Impacts would also include temporary disruption of the vertebrate community structure, including predator/prey relationships, adjacent to the site.

The project design incorporates several mitigation measures designed to reduce impacts to the tortoise. Specific mitigation measures to be utilized will be determined as part of the Section 7 consultation process. While some impacts (such as habitat loss) would be unavoidable at the site, the established mitigation measure of compensating for such habitat loss through the acquisition and transfer to federal ownership of higher quality habitat would be implemented. The level of such habitat compensation would be determined by the BLM in consultation with the USFWS . For the mine expansion to be constructed, these agencies would have to be satisfied that the mitigation measures for the tortoise were adequate so as to prevent the project from jeopardizing the continued existence of the tortoise.

Other Special-Interest Species

Species recognized as sensitive by scientists, conservationists or agencies do occur on or near the project site. As described above, special-interest plant or animal species include: animals designated as "Species of Concern" by the USFWS (FSOC); BLM Sensitive Species (BLM SS); plants occurring on Lists 1A, 1B, 2, 3, and 4 of the *California Native Plant Society's Inventory of Rare and Endangered Vascular Plants of California (CNPS);* animals designated as "Species of Concern"(CSOC) or "Species of Special Concern" (CSOSC) by the CDFG and listed on the Natural Diversity Data Base (NDDB); and, California game species (CGS), because of their economic and recreational value.

Plants

Fairy Duster CDFG NDDB; CNPS #2

The fairy duster *(Calliandra eriophylla)* was found on three of the proposed expansion. Fewer than 20 individuals were found in the proposed "East Rainbow North Overburden/Interburden Area" within three washes, 5-10 individuals were observed within the proposed "East Rainbow Extension", and fewer than 23 individuals were observed within the proposed "Leach Expansion Area". Impacts to fairy dusters in the proposed expansion areas would be significant.

Slender-lobed 4 O'clock flower; CNPS#4

No individuals of slender-lobed 4 o'clock flower *(Mirabilis tenuiloba)* were observed during the survey period. However, suitable habitat does exist within the proposed "East Rainbow South Overburden/Interburden Area" in the large sandy wash that follows the base of the existing waste piles (approximately 10 acres). The loss of potential habitat for this species from the proposed mine expansion would be significant.

Winged Cryptantha; CNPS#4

No individuals of winged cryptantha (*Cryptantha holoptera)* were observed during the survey period. However, suitable habitat was observed throughout the proposed project area. The loss of potential habitat for this species from the proposed mine expansion would be significant.

Ribbed Cryptantha; CNPS#4

No individuals of ribbed cryptantha *(Cryptantha costata)* for this species were observed during the survey period. However, suitable habitat was observed throughout the proposed project area. The loss of potential habitat for this species from the proposed mine expansion would be significant.

Mammals

Mule Deer; CGS

Scat and tracks from mule deer (*Odocoileus hemionus)* were observed within all of the washes in the proposed project area. Approximately 81 acres of microphyll woodland (58 acres unpermitted) will be disturbed as a result of the Reduced Footprint Alternative. However, the proposed expansion areas do not contain any unique or abundant resources as compared to adjacent lands. The development of the proposed mine expansion would decrease available foraging area on a regional basis. However, the surrounding area is virtually undeveloped and would not be affected by the proposed mine expansion. Therefore, there would be no overall effect on the ecological systems that support mule deer and impacts would not be significant.

During mine operations, there is no open water that may attract wildlife. All solution ponds and channels are covered. No water is allowed to accumulate in the mine pits. Such water would interfere with the mining operation. An uncovered and dry "overflow pond" is part of the mine facilities, designed to capture runoff from precipitation events that exceed the 100-year storm. Such events are by definition rare, and animals would have alternative water sources available if such an event occurred. Therefore, there is no impact. Possible impacts associated with mine lakes following completion of mining are addressed in the ecological risk assessment, by Bamberg and Shepherd-Miller, Inc. (2000).

Bighorn Sheep; BLM Sensitive Species; CDFG Game Species

Bighorn sheep (*Ovis canadensis*) have not been observed within the area of the mine but have been observed in the vicinity. Approximately 58 acres of unpermitted microphyll woodland will be disturbed by the proposed expansion. However, the proposed expansion areas do not contain any unique or abundant resources as compared to adjacent lands. The development of the proposed mine expansion would decrease available foraging area on a regional basis. However, the surrounding area is virtually undeveloped and would not be affected by the proposed mine expansion. In addition, no individuals or signs were observed on the proposed expansion areas, and no bighorn sheep have been observed on the property by mine personnel since the opening of the Mine in 1985. Therefore,

there would be no overall effect on the ecological systems that support bighorn sheep and impacts would not be significant.

Bat Species

Suitable roosting habitat was not present within any of the proposed expansion areas, however all of the areas are considered to be suitable as foraging habitat. Three known/potential roosting sites were identified in the region.

There is microphyll woodland between bat-occupied mines and Mesquite Mine, and these woodlands are probably used more heavily than the woodlands on the Mesquite Mine property. According to Dr. Brown-Berry (Personal Communication, 1999) the bats would use a closer source of food than a further one to save energy and time. No potential bat impacts associated with the Proposed Action or the Reduced Footprint Alternative were found to be significant. The reader is referred to Section 4.1.3.3 for details regarding the analysis.

Birds

Avian species of special concern are also known to occur on-site or in the project area. These species include Le Conte's thrasher, the burrowing owl and the prairie falcon. The loss of 456 acres of habitat (190 acres unpermitted) for these species would not be significant given the availability of large-quantities of similar habitat in the Colorado Desert and the exchange and compensation that would occur to obtain the on-site BLM-managed lands.

Burrowing Owl; CSOSC

Suitable habitat for the burrowing owl (*Athene cunicularia*) is present within the proposed expansion areas. However, no individuals or burrows were observed within the proposed expansion areas. Based on the fact that the habitat found within the proposed expansion areas does not exhibit any unique characteristics and is a small percentage of the available habitat surrounding the Mesquite Mine, no impacts to burrowing owls are anticipated.

LaConte's Thrasher; CSOSC

Surveys for LeConte's thrasher (*Toxostoma lecontei*) were conducted on April 10th, 13th and 16th 1999 along the proposed East Rainbow Extension (See NECI Biological Report, June 2000). The washes within the proposed project area were only marginally suitable for LeConte's thrasher (*Toxostoma lecontei*). Only marginal habitat was identified along the northeast portion of the mine expansion, and no individuals were observed during the field surveys. No impacts to LaConte's thrasher are expected.

Prairie Falcon; CSOC

The entire project area was identified as potential foraging habitat for the Prairie Falcon (*Falco mexicanus*) because there are nests in the Chocolate Mountains. These nests or aeries are less then 50 miles away, putting the mine within the known foraging range of nesting pairs. However, no

potential roost sites were observed within the proposed expansion areas. Impacts to this species would be less than significant.

Amphibians

Couch's Spadefoot Toad; FSOC/CSOS/ BLM SS

A population of Couch's spadefoot toad *(Scaphiopus couchii)* lives in an area adjacent to the Algodones Dunes and along SR 78. The Couch's spadefoot toad was not observed within the proposed expansion areas. During surveys for tortoise and thrashers (April 12 - 16, 1999) no areas exhibiting characteristics associated with pooling or ponding of water for 7 to 10 days were observed in the proposed expansion areas. Characteristics evaluated included soil staining, build up of organic material, and desiccation cracks in soil within depressions along the washes. In addition, working mine areas would be bermed to prevent surface flows from increasing downstream sediment flows. For these reasons, impacts to the referenced Couch's spadefoot toad population at the Algodones Dunes would not be significant.

Reptiles

Western Chuckwalla; FSOC/BLM SS

Less than 3 acres of habitat for the western chuckwalla *(Sauromalus obesus)* was observed within the proposed "North Extension" and the proposed East Rainbow North Overburden/Interburden Extension" area. No individuals were observed during the survey but, based on past observations of chuckwalla in the vicinity, it is possible that a population exists within the proposed project area. Impacts to this species would not be significant, based on the thousands of acres of such habitat that is available in the general vicinity of the Mesquite Mine.

Proposed Expansion Areas

Table 4.2.3-2 qualitatively summarizes impacts for each proposed expansion area. Both significant and non-significant impacts are listed.

4.2.3.4 Mitigation Measures

The Reduced Footprint Alternative would utilize the same mitigation measures as the Proposed Action. However, slightly less desert tortoise habitat compensation land would be required. Approximately 246 acres of Category II desert tortoise habitat is anticipated to be affected by development of the Reduced Footprint Alternative. At a 4.5:1 mitigation ratio, this would require 1,107 acres of compensation land. With the addition of 109 acres of land for mitigation of 109 acres of Category III habitat (1:1 ratio), compensation land required would total 1,216 acres. Impacts to Waters of the U.S. and CDFG jurisdictional lands would be mitigated within the compensation lands, at ratios to be determined by ACOE and CDFG, respectively.

Table 4.2.3-2
Summary of Reduced Footprint Alternative Biological Impacts By Proposed Expansion Area

Proposed Expansion Area	Vegetation Impacts	Wildlife Impacts
North Extension Area Big Chief	Loss of habitat for ribbed cryptantha, and winged cryptantha,	Loss of habitat for desert tortoise, western chuckwalla (ns), bighorn sheep (ns), and foraging habitat for the prairie falcon (ns).
North Drainage Diversion	Loss of habitat for the fairy duster, ribbed cryptantha, winged cryptantha,	Loss of habitat for desert tortoise, mule deer (ns), bighorn sheep (ns), burrowing owl (ns), and foraging habitat for the prairie falcon (ns).
East Rainbow North OISA (previously permitted)	Loss > 20 individuals of fairy duster Loss of habitat for the ribbed cryptantha and winged cryptantha,	Loss of habitat for desert tortoise, mule deer (ns), bighorn sheep (ns), burrowing owl (ns), and foraging habitat for the prairie falcon (ns).
East Drainage Diversion	Loss of habitat for the fairy duster, ribbed cryptantha and winged cryptantha,	Displacement of one desert tortoise. Loss of habitat for the desert tortoise, mule deer (ns), bighorn sheep (ns), burrowing owl (ns), and foraging habitat for the prairie falcon (ns).
East Rainbow Extension	Loss of approximately 5-10 individuals of fairy duster Loss of habitat for the ribbed cryptantha and winged cryptantha	Displacement of one desert tortoise. Loss of habitat for the desert tortoise, mule deer (ns), bighorn sheep (ns), burrowing owl (ns), and foraging habitat for the prairie falcon (ns).
East Rainbow South OISA	Loss of habitat for the fairy duster, ribbed cryptantha, winged cryptantha, and slender lobed 4 o'clock flower,	Displacement of one desert tortoise. Loss of habitat for the desert tortoise, mule deer (ns), bighorn sheep (ns), burrowing owl (ns), and foraging habitat for the prairie falcon (ns).
Leach Expansion (previously permitted and compensated)	Loss of > 23 individuals of fairy duster Loss of habitat for the ribbed cryptantha and winged cryptantha	Displacement of one desert tortoise. Loss of habitat for desert tortoise, mule deer (ns), bighorn sheep (ns), burrowing owl (ns), and foraging habitat for the prairie falcon (ns).

Source: NECI, June 2000 (ns) = impact less than significant

4.2.3.5 Level of Significance After Mitigation

The mitigation measures identified in Section 4.1.3. 4 would mitigate the potential impacts of the Reduced Footprint Alternative, such that impacts would not be significant.

4.2.4 Cultural Resources

This section is based on the technical report by Mooney & Associates (February 2000).

4.2.4.1 Assumptions and Assessment Guidelines

The Reduced Footprint Alternative would affect approximately 66 fewer acres of undisturbed lands than would the Proposed Action. Expansion areas not part of the Reduced Footprint Alternative include the Big Chief West OISA (21.2 acres), East Rainbow North OISA (16.3 acres smaller than the Proposed Action), and East Rainbow South OISA (28.7 acres smaller). The assessment guidelines for this alternative are the same as described in Section 4.1.4 for the Proposed Action. The Section 106 process has been completed regarding the Proposed Action. BLM, in consultation with SHPO, has determined that no historic properties would be adversely affected by the Proposed Action, nor the Reduced Footprint Alternative.

4.2.4.2 Significance Criteria

As for the Proposed Action, significance criteria for the Reduced Footprint Alternative were determined based on National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA) Guidelines, Appendix G, Environmental Checklist Form (approved January 1, 1999) and on performance standards or thresholds adopted by responsible agencies.

4.2.4.3 Impacts of the Reduced Footprint Alternative

During a Class III survey and limited testing of the areas of mine expansion for the Proposed Action conducted during March, April, July, and August 1999, a total of 27 sites were identified and evaluated. The Quechan Cultural Committee was consulted extensively throughout the identification and evaluation phases. Based on the evaluation and consultation, the finding was made that no historic properties will be affected by the Proposed Action. Of the sites evaluated, at least 13 of them are located in expansion areas not proposed in the Reduced Footprint Alternative. Although the Reduced Footprint Alternative would disturb only half the sites identified for the Proposed Action, since none of the sites identified were considered significant from a cultural resources perspective, there is no substantive difference in impact associated with the Reduced Footprint Alternative. Neither of the two Mine expansion alternatives would result in a significant impact to cultural resources.

4.2.4.4 Mitigation Measures

Implementation of the Reduced Footprint Alternative Mesquite Mine expansion would not result in significant impacts to cultural resources. As a result, no mitigation measures are necessary.

4.2.4.5 Level of Significance After Mitigation

No mitigation is necessary. Significant impacts would not occur.

4.2.5 Paleontological Resources

4.2.5.1 Impacts of the Reduced Footprint Alternative

No paleontological resources exist at the site. Therefore, no impacts to paleontology would occur as a result of the Reduced Footprint Alternative mine expansion.

4.2.5.2 Mitigation Measures

Development of the Reduced Footprint Alternative would not result in paleontological resource impacts. Therefore, no mitigation would be required.

4.2.6 Transportation

The Reduced Footprint Alternative would be operationally the same as the Proposed Action, including the same daily commuter traffic. The Reduced Footprint Alternative would continue to require an additional 20 to 30 permanent employees. This increase would not be substantial and would not change existing traffic levels associated with the Mesquite Mine. Any temporary construction personnel would only be needed for a short-time period (e.g., days to weeks) and would not impact traffic conditions (See Section 4.1.6). Therefore, the potential transportation impacts of this alternative would be the same as those for the Proposed Action (discussed in Section 4.1.6).

4.2.7 Noise

The Reduced Footprint Alternative would be operationally the same as the Proposed Action. Therefore, the potential noise impacts of this alternative would be similar to those for the Proposed Action (discussed in Section 4.1.7). With implementation of the mitigation measures described in Section 4.1.7, impacts would not be significant.

As described in Section 4.7, the Reduced Footprint Alternative would produce the same noise events on-site as are occurring now, which are related to removal and handling of ore and overburden (drilling, blasting, ore transport and crushing) and construction of haul roads and structures. Off-site noise would not be significant due to the distance between the proposed project activities and off-site receptors. Noise that would occur would be similar to that of the existing mine and similar to that normally experienced with earth-moving activities. Therefore, the Reduced Footprint Alternative would not avoid any significant on-site or off-site noise impacts.

The Reduced Footprint Alternative would reduce temporary noise impacts to traffic along SR 78 in connection with the East Rainbow South OISA construction along the eastern site boundary. However, because proposed project construction activities for the East Rainbow South OISA would be temporary and would only be associated with normal earth-moving equipment, any related noise would likely be inaudible because of driving-related noise. Therefore, the Reduced Footprint Alternative would not substantially avoid any significant construction noise impact.

In addition, the proposed project would not substantially change noise levels from the mine interpretive trail compared to noise levels associated with the existing mining activities. Because noise levels from the interpretive trail would remain the same with or without the Proposed Action, the Reduced Footprint Alternative would not avoid any significant noise impact to sensitive receptors.

4.2.8 Air Quality

Impacts of the Reduced Footprint Alternative are expected to be no greater than those of the Proposed Action because of the following reasons:

- The locations of the key activity areas where diesel fuel would be consumed in the greatest amounts (e.g., shovel digging) are the same in both alternatives.
- The intensity of the activities, such as shoveling, loading and hauling is identical in both alternatives, hence emission rates are identical.
- The distance from those activities to the Mine boundary are the same in both alternatives.

Details regarding air quality impacts of the Proposed Action are found in Section 4.1.8.

4.2.9 Land Use

4.1.9.1 Assumptions and Assessment Guidelines

The Reduced Footprint Alternative would exclude the 20-acre Big Chief West OISA, 16 acres of the East Rainbow North OISA, and 33 acres of the East Rainbow South OISA. All other facilities of this alternative would be identical to those of the Proposed Action. This land use impact analysis considers the potential effects of the Reduced Footprint Alternative on existing and planned land uses in the vicinity of the mine site. The Proposed Action's effect on surrounding land uses would be significant if the proposed expansion would be incompatible with existing land uses. The Proposed Action's effect on planned land uses would be considered significant if the proposed expansion would be not in conformance with the applicable land use plans and policies described in Section 3.1.9 of this EIR/EIS. Other potential impacts of the proposed expansion include aesthetics, noise, traffic, air and ground water quality, and other issues that are analyzed in more detail in Chapter 4 in this EIR/EIS.

4.1.9.2 Impacts of the Reduced Footprint Alternative

The following discussion considers the effects of all proposed and optional facilities on the proposed expansion site, and nearby lands. The use of the Reduced Footprint Alternative would be in conformance with all adopted plans and policies, as described in the Noise, Transportation, and Public Health and Safety sections, and with existing land uses.

Compatibility with Existing and Surrounding Land Uses

Mesquite Mine

The Reduced Footprint Alternative, as for the Proposed Action, is within a designated mine site except for the two north half sections that were once part of the Chocolate Mountains Aerial Gunnery Range (CMAGR). The previous EIR found that the operation (as implemented) would not create land uses incompatible with those on the surrounding lands. Existing mining and recreation uses were not projected to be significantly affected by the mining operation. The Proposed Action would result in expansion and a longer period of mining activities on the existing site, which essentially postpones future non-mining use of the mine pit, overburden disposal areas and the heap leach area. The physical characteristics of remaining primary project facilities would permanently alter the area's value for visually-sensitive recreation activities. Reclamation of the site would mitigate the visual intrusion of the mine and therefore, its impact on related recreation activities. Changes associated with the Reduced Footprint Alternative are essentially the same as for the Proposed Action, but with 66 acres less surface disturbance.

Surrounding Community

Land uses surrounding the proposed project site include residential and commercial uses at the Boardmanville and Glamis Beach Store areas, the ISDRA, North Algodones Dunes Wilderness Area and ACEC, and large open space areas used for OHV riding, target shooting, hunting, and prospecting. The mine is located at least three miles from these uses. Due to the distances between the mine and residential, commercial, and recreational uses, the mine expansion would not be an incompatible land use, and impacts would not be significant. This is the same as that of the Proposed Action.

BLM Public Lands

The Reduced Footprint Alternative would add approximately 41 acres of federal land presently outside mine permit areas and managed by the BLM. This is 52 acres less than the Proposed Action (18.6 acres at Big Chief West OISA plus 33.3 acres at the south end of the East Rainbow South OISA). Although this is a decrease from that of the Proposed Action, since that change was not deemed a significant impact, neither will this.

For the mine to be expanded to the north of the existing mine as proposed, BLM agreed in 1996 to exchange state school lands pursuant to the California Desert Protection Act for BLM owned lands (the two north half sections) located in the CMAGR. The purpose for this exchange is for their likely mineral value and the potential value of future revenues to the State Teachers Retirement Fund. This issue, and all others related to BLM public lands, is identical to that of the Proposed Project / Action. There would be no impact to the Singer Geoglyphs ACEC.

Chocolate Mountains Aerial Gunnery Range

The proposed expansion would be compatible with the CMAGR. Existing uses of the CMAGR include military aircraft training and testing. As with the Proposed Action, the only issue is that of

lighting and its potential interference with pilot's NVDs (Night Vision Devices). Potential lighting impacts to the CMAGR are discussed in Section 4.1.11, Visual Resources, of this EIR/EIS.

Compatibility with Adopted Land Use Plans and Policies

There is no substantial difference between the Reduced Footprint Alternative and the Proposed Action relative to conformance with the Imperial County General Plan, Imperial County Zoning Regulations, California Desert Protection Act and the BLM CDCA Plan. Both alternatives are in conformance with these plans or policies, as discussed in Section 4.1.9. No significant impact would occur.

4.2.9.4 Mitigation Measures

Since land use impacts from the Reduced Footprint Alternative would not be significant, no mitigation is required.

4.2.9.5 Level of Significance After Mitigation

No mitigation would be required, and land use impacts would not be significant.

4.2.10 Recreational Resources

4.2.10.1 Assumptions and Assessment Guidelines

The Reduced Footprint Alternative would exclude the 20-acre Big Chief West OISA, 16 acres of the East Rainbow North OISA, and 33 acres of the East Rainbow South OISA. This alternative would also store 91.6 million tons of waste rock in the existing mine pits, versus 12.6 million tons for the Proposed Action. All other facilities of this alternative would be identical to those of the Proposed Action. The following impact analysis considers the effects of the Reduced Footprint Alternative on recreational resources in the vicinity of the Mesquite Mine. Potential impacts of this alternative include aesthetics, noise, traffic, air and ground water quality, and other issues that are analyzed in more detail elsewhere in Chapter 4 in this EIS/EIR.

For this analysis, recreational resource impacts would be considered significant if the Proposed Action would substantially degrade or reduce the quality or quantity of the area available for existing or future recreational opportunities. An unmitigated loss of a unique recreational resource would be a significant impact. Non-conformance with the Wilderness Act of 1964, the California Desert Protection Act (CDPA) or the BLM Interim Management Policy would be a significant impact.

4.2.10.2 Impacts of the Reduced Footprint Alternative

Mesquite Mine Site

The only recreational resource on the mine site itself is the Mesquite Mine Overlook Trail. The trail was a voluntary project undertaken by the Mine and the BLM. The joint BLM/Gold Fields agreement that created this unique recreational resource allows either party to "walk away" from the agreement with 30-days notice. The self-guided trail would not be affected by the mine expansion. The Reduced Project Alternative would introduce additional overburden piles, as described in Section 4.1.11, Visual Resources. The Mesquite Mine Overlook Trail is the only recreational resource provided on-site. This trail is provided specifically for viewing the mine. Visual impacts to the Overlook Trail would not be significant because the trail would continue to provide views of the mine. This is the same impact level discussed for the Proposed Action.

The area surrounding the Mesquite Mine is used by approximately 4,000 visitors a year. However, the majority of recreational users counted in this survey used lands located closer to Glamis than to the proposed site. There are approximately 280,000 acres of BLM Class M and Class I desert lands available for recreation in the CDCA in Imperial County. The Proposed Project would not result in any disturbance of federally-owned land that has not already been committed to mining, and the northern expansion would not result in any loss of BLM Class M nor Class I land available for recreation. There would be no loss to recreational lands, and therefore the neither the Reduced Footprint Alternative nor the Proposed Action would significantly affect existing or future recreational opportunities.

The mine and associated facilities are located a sufficient distance from the ISDRA that it would not significantly impact recreational uses at the sand dunes. The Mesquite Mine is far enough away that on-site noises would not be heard in the ISDRA or the more heavily used camping areas. Impacts associated with project-related traffic on SR 78 would not be significant.

Wilderness Areas

The wilderness areas identified in Section 3.1.10 are located far enough away from the mine that impacts would not be significant. This result is identical to that of the Proposed Action.

4.2.10.4 Mitigation Measures

The Applicant shall implement the mitigation measures described in the Transportation (4.1.6), Noise (4.1.7), and Environmental Health and Public Safety (4.1.12) sections of this EIR/EIS to mitigate impacts from the Reduced Footprint Alternative to recreational resources.

Mesquite Mine Site

Incorporated by Regulation

There would be no additional mitigation measures required by regulation to mitigate recreational resource impacts besides those described in Sections 4.1.6, 4.1.7, 4.1.8, and 4.1.12.

Incorporated by Project Design

Although the project area does not have a high rating for scenic recreation, reclamation of the site and implementation of visual mitigation measures would partially mitigate the visual intrusion of the project and therefore, its impact on related recreation activities. Mitigation measures incorporated by project design are described in Sections 4.1.6, 4.1.7, 4.1.8, and 4.1.12.

Incorporated to Avoid Potentially Significant Impacts

The above mitigation measures would fully mitigate impacts associated with on-site activities to recreational resources. Therefore, additional mitigation would not be required.

4.2.10.5 Level of Significance After Mitigation

Impacts to recreational resources by the Reduced Project Alternative would be fully mitigated by the measures described above. With mitigation, impacts would not be significant.

4.2.11 Visual Resources

4.2.11.1 Assumptions and Assessment Guidelines

As for the analysis of the Proposed Action, for the purposes of this analysis, a significant visual impact is defined as project-related change that would be considered substantial in a VRM Class III area as follows:

- A strong degree of contrast (i.e., where the project-related element contrast demands attention, would not be overlooked, and is dominant in the landscape).
- Light and glare conditions that would adversely and substantially affect a sensitive receptor.

4.2.11.2 Impacts of the Reduced Footprint Alternative

Locations of proposed physical mounds of materials that would be visible from outside the Mine site are shown in Figure 3.11-1. Of the four areas, the northernmost (East Rainbow North OISA) and the westernmost (Big Chief West OISA) would not be visible from the selected viewpoints along SR 78. While they would be visible from other locations, their relatively small size, their proximity to other, larger material piles, and the lack of a nearby viewpoint from which many persons could see them indicate that they will result in no significant visual impact. The proposed heap leach pad expansion located at the southern side of the Mine site will be the same design and size for both the Proposed Action and the Reduced Footprint Alternative. Visual impact issues associated with this proposed facility expansion are discussed in Section 4.1.11, and illustrated in Figure 4.1.11-1. No significant visual impact was identified for the heap leach pad expansion, because Reduced Footprint Alternative would result in only an incremental change from Mine development is already permitted.

Consequently, only the visual changes associated with the easternmost proposed facility expansion (East Rainbow South OISA) remain to be addressed. The Reduced Footprint Alternative differs from the Proposed Action for this proposed facility in that the southern end of the facility would not come as close to SR 78 as would the design in the Proposed Project. The key visual issue for analysis of the Reduced Project Alternative, as it was for the Proposed Action, is the degree of visual change anticipated from currently permitted Mine development. This is graphically illustrated in the visual simulations shown in Figure 4.2.11-1. While the OISA resulting from the Reduced Footprint Alternative is more visible than the one that is currently permitted, the visual change is also clearly incremental.

As noted in the analysis for the Proposed Action, the VRM Class III standard allows a moderate degree of visual change. Because the proposed OISA expansion would result in an incremental change, short-term impacts would be low to moderate and would conform to these VRM Class III guidelines. Therefore, visual impacts would not be significant.



SOURCE: BRG Consulting, Inc., 2000.

5/4/00

BRG CONSULTING, INC.

Mesquite Mine Expansion EIR/EIS

Visual Simulations of No Project/ Action and Reduced Footprint Alternative, View Point No. 2

FIGURE 4.2.11-1



SOURCE: BRG Consulting, Inc., 2000.

5/4/00

BRG CONSULTING, INC.

Mesquite Mine Expansion EIR/EIS

Visual Simulations of Proposed Action and Reduced Footprint Alternative, View Point No. 2

FIGURE 4.2.11-2

vehicles travelling on SR 78. The Reduced Footprint Alternative, from Viewpoint No. 2 at least, does not appear to result in a reduction in visual impact from that of the Proposed Action. Neither does it appear to result in substantially more impact.

Light and Glare

Night lighting would be provided at the mine to facilitate up to 24-hour operations. There would be no substantive difference between the night lighting associated with the Reduced Project Alternative versus that of the Proposed Action. No significant unmitigated lighting impact was identified for the Proposed Action (see Section 4.1.11), and none would occur with the Reduced Project Alternative.

Site Reclamation

Newmont has developed conceptual final reclamation configurations for the OISAs that include minor regrading. The configurations have been developed to provide a more aesthetically pleasing landscape, creating a terrain that is conducive to the native surrounding area. The same site reclamation, regrading and revegetation measures will be utilized for the Reduced Footprint Alternative as for the Proposed Action. See Section 2.1.7 of this EIR/EIS. As with the Proposed Action, long-term visual impacts from the OISAs and heap leach pads would be reduced by the proposed reclamation activities. Long-term visual impacts would be in conformance with the VRM Class III Guidelines and would be insignificant.

4.2.11.4 Mitigation Measures

Measures Incorporated by Regulation

There would be no mitigation measures required by regulation.

Measures Incorporated by Project Design

Following completion of Project mining activities, all buildings, equipment, supplies, and debris shall be removed to improve the visual appearance of the Project area.

The applicant shall ensure that project-related lighting is pointed toward the ground and not at sensitive receptors such as drivers on SR 78 and concentrations of campers in the Glamis and Boardmanville areas.

The Applicant shall minimize the presence of reflective material on-site at night that could reflect downward pointed light up or toward sensitive receptors.

The Applicant shall construct the proposed mine expansion so that it resembles a natural landform to the extent practicable. The tops and sides of all OISAs would be contoured.

In conformance with the Reclamation Plan as approved by the BLM and Imperial County, all disturbed areas shall be recontoured and reseeded or revegetated with native or indigenous species complementary to vegetation found in the surrounding area.

Mitigation Measures Proposed to Avoid Potentially Significant Impacts

The potentially significant impact of night lighting on NVDs shall be mitigated by providing the U.S. Marine Corps Air Station, Yuma, Arizona, with a map identifying the project site and specific locations of all potential light sources. This would enable the U.S. Marine Corps Air Station to identify the site as a light source so that pilots using NVDs can avoid the lighted area.

4.2.11.5 Level of Significance After Mitigation

The potential for impacts to NVDs would not be significant with incorporation of the proposed mitigation.

4.2.12 Potential Environmental Health and Safety Impacts

4.2.12.1 Assumptions and Assessment Guidelines

This section evaluates the potential public health and safety impacts that could be associated with the proposed expansion of the Mesquite Mine (Mine) as described in the Reduced Footprint Alternative. As discussed previously, this alternative is the same as the Proposed Action, except that the areas of three proposed OISAs would be less by approximately 66 acres. All other operational and closure activities would be the same as for the Proposed Action (as discussed in Section 4.1.12).

A potential impact is considered significant if it would create a substantial increase in risk to public health or safety. Potential impacts to ground water, transportation and other elements of the human environment are considered in other sections of the EIR/EIS. Reference to those analyses are made, where appropriate, when they also involve issues associated with public health and safety.

4.2.12.2 Impacts Of The Reduced Footprint Alternative

Mining Activities

The process of mining raw ore material involves activities that could generate potential health and safety impacts to the public and Mine employees. Blasting and the use of heavy construction equipment typical of mining operations that are utilized during Mine operations. These methods have been employed by Mine staff from the beginning of mining activities in 1984. These activities would be the same for the Reduced Footprint Alternative as for the Proposed Action.

Given the remote location of the Mine, potential for significant health and safety impacts to the public resulting from mining operations is not expected. The closest residence to the Mine is approximately one mile away. Noise from blasting activities would be the only potential impact to the area surrounding the Mine. Further discussion of noise impacts is provided in Section 4.1.7 of this EIR/EIS.

Measures for mitigating potential health and safety impacts to Mine employees resulting from mining activities were established at the beginning of Mine operations in 1984. Procedures for handling and discharge of explosives are delineated by the Mine Safety and Health Administration (MSHA) and the Newmont Safety manual. Explosives are stored in a secured powder magazine constructed and maintained in accordance with Federal and local permit requirements.

Guidelines for operating heavy construction equipment involved in transportation of overburden and ore to storage and agglomeration facilities are set forth in the Newmont Safety manual. No significant potential health and safety impacts to Mine employees resulting from mining operations are expected.

Processing Activities

Heap Leaching

Heap leaching removes gold from the ore. The heap leach system consists of heap leach pads, where ore is leached, and solution ponds where the dilute sodium cyanide solution is contained. The heap leach facilities are constructed over an impervious liner. These liners are designed to meet requirements of the Regional Water Quality Control Board (RWQCB), which establishes specific standards on liner permeability. The sodium cyanide solution application system is contained within closed piped to prevent potential release of the solution. Solution containment ponds are designed to accommodate additional run-off from the heap leach pads and direct precipitation that could result from large rainstorm events. These activities would be the same for the Reduced Project Alternative as for the Proposed Action.

Potential health and safety impacts to the public and Mine employees resulting from the heap leach process exist through exposure to the dilute sodium cyanide solution. Cyanide has been used in various processing methods to extract gold from ore for over 100 years. The technology of using a dilute sodium cyanide solution to heap leach gold from relatively low grades of ore was initially developed in the early 1970s. Commercial applications of the technology started in the late 1970s and have grown rapidly because it is the only economically feasible method to recover gold from disseminated ore bodies where the gold exists at low concentrations.

Consequently, health and safety impacts to the public and Mine employees resulting from the heap leach process are not expected. Although Mine employees work in close proximity to the process solutions, there are no known cases of accident or severe illness directly due to sodium cyanide solution exposure. Guidelines and handling procedures for application and management of the leaching solution are provided in the Newmont Safety manual. Federal and state regulations for use of cyanide solution in leaching processes are also enforced by MSHA and RWQCB.

Impervious liners under the heap leach pads, pregnant solution conveyance channels and associated facility components minimize the potential for exposure of the sodium cyanide solution to surface soils. The chosen solution application method significantly reduces potential for airborne distribution of the sodium cyanide solution. In addition to the facilities engineered for containment, protection of water quality is also provided by the reactivity of cyanide, which results in its volatilization into the atmosphere, its natural degradation to nontoxic carbon and nitrogen compounds and its fixation with the trace metals in the environment to form less toxic complexes over time.

Gold Recovery Process

Pregnant solution is transferred from the solution collection ponds of the heap leaching facilities to the gold recovery facilities. A carbon adsorption process is performed to retrieve gold from the pregnant sodium cyanide solution. Gold is desorbed from the carbon using stripping solution and then pumped to electrowinning cells for formation of the final material that undergoes benefaction. These activities would be the same for the Reduced Project Alternative as for the Proposed Action.

Potential health and safety impacts to the public and Mine employees exist through exposure to reagents used in the gold recovery process (i.e., sodium cyanide solution and carbon stripping solutions). As with the processes used in heap leaching, those utilized for the gold recovery process are well established in gold extraction operations. The Mine incorporated these methods as part of daily operational activities at the beginning of operations in 1984.

Potential health and safety impacts to the public and Mine employees resulting from exposure to reagents used in the gold recovery process are not expected. Additions to existing facilities are not proposed as part of the Mine expansion. Design features of the gold recovery facilities and process previously discussed provide mitigation of potential release or exposure. The Newmont safety manual provides internal guidelines and regulations for proper execution of gold recovery. Specific step-by-step instructions for controlling spills are also provided.

Domestic And Industrial Waste

Domestic and industrial wastes generated during Mine operations are disposed of according to County and State of California (State) regulations. These activities would be the same for the Reduced Footprint Alternative as for the Proposed Action.

Impacts to the public and Mine employees resulting from generation of domestic and industrial wastes are not expected. Regulations and guidelines for proper disposal, handling and management of domestic and industrial wastes are set forth by County and State agencies. The Newmont safety manual also provides internal procedures for generation of domestic and industrial wastes. These regulations and guidelines have been observed by the Mine since operations began in 1984.

Transport Of Chemical Reagents And Explosives

Mining and gold recovery operations at the Mine require the use of select chemical reagents, explosives and fuels. These materials will be stored on site in appropriate facilities. Explosives and chemical reagents require specific storage enclosures and conditions as mandated by OSHA, Cal-OSHA, MSHA and the Newmont safety manual. These activities would be the same for the Reduced Footprint Alternative as for the Proposed Action.

Explosives and detonators are stored in two secure magazines on-site. No change in magazine location on procedures would result from the Proposed Action. As previously mentioned explosives storage facilities are constructed according to guidelines provided by OSHA, Cal-OSHA and MSHA.

Impacts to the public and Mine employees resulting from the transportation and storage of chemical reagents and explosives are not expected. Licensed contractors will transport the previously discussed materials to the Mine. Federal and State guidelines for highway transportation of these goods will be observed. Upon reaching the Mine all chemical reagents and explosives will be stored according to OSHA, Cal-OSHA and MSHA guidelines. As an additional safety management measure, emergency response agencies (i.e., fire department and police department) will be provided with a list of materials being transported to the Mine and the routes used by the licensed contractors.

Security and Safety

Security and safety measures would be employed to minimize the risks of accidental or injury to unauthorized or untrained persons. These activities would be the same for the Reduced Footprint Alternative as for the Proposed Action. With continuation of existing security and safety procedures, impacts to the public due to potentially dangerous mining activities are not expected.

Mine Traffic

Mine operations require the use of various pieces of heavy construction equipment. Transportation of ore from the open pit mines to the heap leach gold recovery areas requires the use of haul trucks and other vehicles necessary for operation of the Mine. Haul trucks are capable of transporting 150 tons of mined ore per load and require more operational space than most Mine vehicles. These activities would be the same for the Reduced Footprint Alternative as for the Proposed Action.

Potential heath and safety impacts to the public and Mine employees resulting from on site traffic are not expected. Vehicular traffic generated during mining, heap leach and gold recovery activities is retained within the boundary of the Mine. Mine employees required to operate vehicles on site are trained in correct operating procedures. The Newmont Safety manual provides specific vehicle operating procedures.

Mine Reclamation

Reclamation would occur for decommissioned facilities during ongoing Mine operation, and for remaining facilities following project completion. Safety measures such as restricting access to pit mines, heap leach pad neutralizing and decommissioning, and storage pond neutralizing would be accomplished. Closure will result in the removal of surface structures associated with ancillary facilities. Some access roads may remain following mine closure to provide access for monitoring and for continuing access to Newmont private lands. As discussed in Sec. 2.1.7, the mine area cannot be returned to its original contours. Limited regrading and surface scarification will be used to create and enhance a self-supporting desert ecosystem. Post closure monitoring will assess surface and ground water for closure of heap leach pads, and determine erosion control and revegetation success for reclamation. These activities would be the same for the Reduced Footprint Alternative as for the Proposed Action.

Potential health and safety impacts to the public and Mine employees could result from reclamation activities. Improper or inadequate closure and reclamation of the mining, heap leach and gold recovery facilities could result in such impacts.

Potential health and safety impacts to the public and Mine employees resulting from Proposed Action reclamation activities are not expected. Newmont has created a detailed, encompassing site Closure Plan for the Mine. The Closure Plan has been prepared to satisfy requirements of Section 2574, Article 7 of the CCR (Shepherd Miller, Inc., 1998). A complete Closure Plan can be found in the Consolidated Plan of Operations. As previously mentioned, the Closure Plan addresses reclamation of the various operational aspects of Mine operations. Concurrent reclamation of the

Mine began in 1998 and will continue until closure. Reclamation activities concentrate on those areas that are no longer active.

4.2.12.4 Mitigation Measures

Incorporated by Regulation

The Applicant shall incorporate environmental health and public safety protection measures required by local, State, or federal regulations into the proposed mine expansion, design and operation, specifically, appropriate OSHA and Cal OSHA worker environmental health and public safety regulations and continuance of established public safety measures and programs existing at the Mine.

Incorporated to Avoid Significant Impacts

Since environmental health and safety impacts will not be significant and will not change from existing conditions at the Mine, no mitigation measures to avoid significant impacts are required.

4.2.12.5 Level of Significance After Mitigation

Based upon regulatory requirements and safe operating practices used at the Mine since 1984, no significant impact to health and safety would occur from this Reduced Footprint Alternative.

4.2.13 Socioeconomics

4.2.13.1 Assumptions and Assessment Guidelines

Socioeconomic impacts derive primarily from changes in the existing makeup of a community. Changes in the age, ethnicity, or income distribution of an area may affect the community either negatively or positively. For the purposes of this EIR/EIS, an adverse significant socioeconomic impact is defined as follows:

- A substantial decrease in employment within the County.
- A substantial decrease in the wage and salary earnings in the County.
- A substantial decrease in the average wage and salary earnings per job in the County.

From a socioeconomic perspective, the Reduced Footprint Alternative is identical to the Proposed Action. The same number of persons will be employed, the work will occur at the same general location, the same payrolls and royalty payments will be generated, and the work will occur over the same time periods.

4.2.13.2 Impacts of the Reduced Footprint Alternative

Employment and Income

Impacts to employment and income from the Proposed Action were found to be beneficial, and those of the Reduced Footprint Alternative would be identical.

Government Revenues

Impacts to government revenues from the Proposed Action were found to be beneficial, and impacts from the Reduced Footprint Alternative would be identical.

4.2.13.3 Mitigation Measures

Mitigation Measures Incorporated by Regulation

The Applicant shall, as required by Title 23, CCR, Section 2574(f), prepare an initial estimate of the closure and post-closure maintenance and corrective action costs. A trust fund or equivalent financial surety that is acceptable to the RWQCB shall then be established and maintained.

The Applicant shall pay for all required environmental monitoring activities as provided by law.

No post-closure maintenance or other corrective actions are anticipated to be needed. The closure bond estimate has been prepared, and is incorporated into the Reclamation Plan portion of the POO. The bond will be established prior to disturbance of proposed expansion areas.

Mitigation Measures Incorporated by Design

No design mitigation measures are required.

4.2.13.4 Level of Significance After Mitigation

Implementation of the Reduced Footprint Alternative would result in no significant adverse socioeconomic impacts.

4.2.14 Public Services and Utilities

4.2.14.1 Assumptions and Assessment Guidelines

The following impact analysis considers the effects the Reduced Footprint Alternative would have on the existing Imperial County public services and the currently available utilities at the Mesquite Mine. Public service and utilities impacts would be considered significant if existing or proposed facilities would be insufficient to provide for the needs of the proposed project.

4.2.14.2 Impacts of the Reduced Footprint Alternative

Mesquite Mine is a permitted, open functioning mine. As discussed under the Proposed Action, the public services and utilities are already in place and impacts of that expansion were not considered significant. The same analysis applies to the Reduced Footprint Alternative, because while the amount of new surface disturbance would be reduced, the activities of excavating and processing the ore are the same as for the Proposed Action.

Public Services

Mining operations would involve the handling and use of heavy equipment and hazardous materials (e.g., motor oil and gasoline), and create the potential for occasional work-related injuries requiring medical attention. The Applicant currently has procedures that provide employees with a safe workplace. The Applicant provides a security force, and fire fighting systems that adequately meet the requirements of this alternative. As described in Section 4.1.13, Environmental Health and Public Safety, fires would be extinguished using on-site equipment and personnel. Imperial County fire fighting equipment personnel would not be affected.

Additional services would be available in Brawley, about 35 miles west of the site, and could be called upon in unusual emergencies (e.g., ambulance transport services). Consequently, the potential impacts related to availability of police, fire, and medical services would not be significant.

Community Facilities

Neither the Proposed Action nor the Reduced Footprint Alternative is expected to generate significant population growth, and therefore any significant demand for local community facilities, in the communities in which any Project employees and/or contractors, and their respective families, who may relocate for their job with the mine.

Mesquite Mine employees and their families use the schools, recreational facilities and libraries located within the vicinity of their residences. The mine expansion would potentially create only 20 to 30 new jobs at the site, so there would be no significant increase in the demand for schools, parks, recreational facilities, and libraries.

Utilities

Utilities would be the same for the Reduced Footprint Alternative as for the Proposed Action. As with the Proposed Action, no substantive increases in utility useage are projected, and no new utility infrastructure would be required. Impacts to utilities would not be significant.

As described in the Water Resources section of this EIR/EIS (Section 4.1.2), storm water diverted around the mine, and runoff directly from the facility, is directed to the three existing SR 78 wash crossings. Proposed drainage facilities would not increase the risk of downstream flooding or cause flood velocities or volumes that would cause the washout of downstream facilities or infrastructure. Therefore, impacts would not be significant.

4.2.14.4 Mitigation Measures

Incorporated by Regulation

- The Applicant shall supply all MSHA- and Cal MSHA-required training, supplies, and equipment.
- The Applicant shall provide precipitation drainage facilities as described in Sections 4.1.2 and 4.2.2 of this EIR/EIS.

Incorporated Into Project Design

- The Applicant shall provide on-site security, fire protection services, and medical services.
- The Applicant shall construct a six- to eight-foot-high industrial fence, except where existing fencing can be utilized. All proposed expansion areas would be fenced where necessary for security and to avoid unauthorized entry. All new fencing surrounding the proposed mine expansion site would be constructed according to BLM specifications for tortoise fencing. Existing fencing has been improved in places to exclude desert tortoises from entering the Mesquite Mine. The existing fences would be further improved if required to successfully conclude consultation under Section 7 of the Endangered Species Act.

4.2.14.5 Level of Significance After Mitigation

With the implementation of required mitigation measures, impacts of the Reduced Footprint Alternative would not be significant.

4.2.15 Conclusion

The Reduced Footprint Alternative is environmentally superior to the proposed project because it would avoid some Proposed Project significant impacts to biological resources, including the threatened desert tortoise, Department of Fish and Game jurisdictional streambed, and Army Corps of Engineers jurisdictional waters of the United States.

4.3 NO PROJECT ALTERNATIVE

4.3.1 Geology/Soils/Mineral Resources

The proposed mine expansion site was selected based on the distribution of gold ore as identified by exploratory investigations conducted by the Mine. These areas were identified based on structural stability of the rock that forms the pit walls and by the ability to economically mine, haul and process the ore. Under the No Project Alternative, the Proposed Action would not be constructed. All mining would occur within already permitted areas as defined under existing approvals, and mine reclamation would occur in accordance with the existing reclamation plans. Consequently, the No Project Alternative would result in completion of mining no later than the middle of the year 2001. This would reduce conformance with the basic objectives of the Proposed Action; which is to profitably recover as much of the precious metals within the Mine site as possible, in conformance with the 1872 Mining Act.

The Proposed Action would not adversely affect valuable economic mineral resources, geothermal or other leaseable mineral resources, nor would it result in a significant seismicity impacts (See Section 4.1); therefore, the No Project Alternative would not avoid or reduce any Proposed Action impacts associated with these geology issue areas.

During rain events, the Proposed Action would potentially increase erosion on the manufactured slopes of the OISAs and where the proposed diversion channels would redistribute storm flows into existing down gradient washes. However, these potential impacts could be fully mitigated with standard engineering practices developed by the mine, and construction/operation in accordance with a Stormwater Pollution Prevention Plan as required under the State of California NPDES general permit for stormwater (See Section 4.1). Therefore, the No Project Alternative would not avoid any Proposed Action significant erosion impacts that cannot be fully mitigated with standard construction practices.

4.3.2 Water Resources

The No Project Alternative would avoid six additional years of groundwater use by the mine. For the No Project Alternative, the additional well water needed for dust control, ore processing and other needs associated with the Proposed Action would not be used. However, the rate and quantity of water extraction required for the Proposed Action would remain within the amounts already permitted for the Mesquite Mine, and has been analyzed in prior CEQA/NEPA documents for the Mesquite Mine (See Section 4.1.2). These previous documents found the permitted mining area to have impacts that are less than significant (Environmental Solutions, Inc., 1987); therefore, the No Project Alternative would not avoid or reduce any significant impacts to water resources from currently permitted activities.

However, because the No Project would not result in an expansion of an additional 142-189 acres beyond that which is already permitted, it would avoid impacts to an additional 22-25 acres of Army Corps of Engineers jurisdictional waters and up to 61-65 acres of Department of Fish and Game jurisdictional streambed.

As discussed in Section 3.2.3.5, the existing pits have lakes in the bottoms. Due to evapoconcentration, the long-term water quality of these existing lakes under the No Project Alternative would be similar to the long-term water quality that would occur for the pit lakes under the Proposed Action or the Reduced Footprint Alternative. The pit water quality would not have a significant impact on ground water or surface water due to factors described in previous sections. Therefore the No Project Alternative would not reduce or eliminate any significant impacts related to lakes in the in the mine pits.

The No Project Alternative would reduce the term of fuel and reagent use by the Mine by approximately six years. However, because of protective measures implemented by the Mine in conformance with governmental regulations, as described in previous sections, impacts of fuel and reagent use under the Proposed Action or the Reduced Footprint Alternative would be less than significant. Therefore the No Project Alternative would not reduce or eliminate any foreseeable significant impacts related to fuel or reagent use.

Under the No Project Alternative, there would be no need for further modifications to surface water drainage through the Mine site. However, as described in previous sections, engineering measures will result in drainage modifications for the Proposed Action or the Reduced Footprint Alternative with impacts that are less than significant. Therefore the No Project Alternative would not reduce or eliminate any significant impacts related to surface water drainage modifications.

4.3.3 Biological Resources

The No Project Alternative would avoid additional impacts to vegetation or wildlife at the proposed mine expansion area. It would avoid the direct loss of approximately 380 acres of creosote/desert pavement habitat, approximately 67 acres of microphyll woodland habitat, and approximately 45 acres of upland succulent habitat. Direct significant impacts to desert tortoise and fairy duster would also be avoided.

In addition, the No Project Alternative may avoid impacts to an additional 22 acres of Army Corps of Engineers jurisdictional waters and Department of Fish and Game jurisdictional streambed within the proposed expansion area. However, under this alternative, compensation for biology impacts from the Proposed Action (which consists of - Category II and III desert tortoise habitat) with higher quality habitat would not occur because impacts to desert tortoise habitat from the No Project Alternative have already been compensated. As such, BLM would not gain ownership of additional higher quality desert tortoise habitat.

4.3.4 Cultural Resources

The No Project Alternative would not disturb unpermitted land within the Proposed Action boundary. The Proposed Action would not have an adverse effect on any historic properties because, based on field work and testing, all of the sites identified sites within the Proposed Action area are ineligible for nomination to the National Register of Historic Places (See Section 4.1.4). Therefore, the No Project Alternative would not avoid or reduce any significant cultural resource impacts.

4.3.5 Paleontological Resources

If the No Project Alternative were implemented, unpermitted land within the Proposed Action boundary would not be disturbed. The Proposed Action would not have an adverse effect on paleontological resource because there are no fossil-bearing geologic formations underlying the Proposed Action site. Therefore, the No Project Alternative would not avoid any significant paleontological resource impacts.

4.3.6 Transportation

The No Project Alternative would avoid six additional years of mine-related trips on local roads. The planned mine expansion may require an additional 20 to 30 permanent employees. This increase would not be substantial and would not change existing traffic levels associated with the Mesquite Mine. Any temporary construction personnel would only be needed for a short-time period (e.g., days to weeks) and would not impact traffic conditions (See Section 4.1.6). Therefore, the No Project Alternative would not avoid any significant traffic impacts.

As described in Section 4.1.6, during the winter-spring season (from October to May) weekend traffic along the segment of SR78 near the existing mine reaches LOS F. Existing mine-related traffic already contributes to overcrowding on this highway during these months. Because the Proposed Action would not change existing traffic levels, cumulative impacts to SR78 during this period would be the same with or without the Proposed Action. Therefore, the No Project Alternative would not avoid any significant cumulative traffic impacts.

4.3.7 Noise

The No Project Alternative would avoid six years of mine-related noise. As described in Section 4.1.7, the Proposed Action would produce the same noise events on-site as are occurring now, which are related to removal and handling of ore and overburden (drilling, blasting, ore transport and crushing) and construction of haul roads and structures. Off-site noise would not be significant due to the distance between the Proposed Action activities and off-site receptors. Noise that would occur would be similar to that of the existing mine and similar to that normally experienced with earthmoving activities. Therefore, the No Project Alternative would not avoid any significant on-site or off-site noise impacts.

The No Project Alternative would avoid temporary noise impacts to traffic along SR 78 in connection with the drainage system construction along the eastern site boundary. However, because Proposed Action construction activities for the drainage system would generally be one or more miles from mine activities, would be temporary, and would only be associated with normal earth moving equipment, any related noise would likely be inaudible because of driving related noise. Therefore, the No Project Alternative would not substantially avoid any significant construction noise impact.

In addition, the Proposed Action would not substantially change noise levels from the mine interpretive trail compared to noise levels associated with the existing mining activities. Because noise levels from the interpretive trail would remain the same with or without the Proposed Action, the No Project Alternative would not avoid any significant noise impact to sensitive receptors.

4.3.8 Air Quality

The air quality analysis conclusions were based on the current production level because production is not anticipated to increase with the Proposed Action. The No Project Alternative is limited to a total annual production of 60 million tons of overburden/interburden and ore. Therefore, impacts of the No Project Alternative would be similar to those impacts of the Proposed Action as described in Chapter 4.1.8.5. Existing mine operations emit the same type of mobile, point and fugitive emission sources as described for the Proposed Action. The No Project Alternative would terminate existing mine operations no later than the middle of the year 2001 and have twenty to thirty less permanent employees, which would mean less adverse air quality impacts from mining operations than the Proposed Action. Although air quality impacts would be similar to the Proposed Action, the No Project Alternative would marginally contribute to the attainment of air quality standards by terminating operations in the year 2001 instead of 2006.

4.3.9 Land Use

Similar to the Proposed Action described in Section 4.1.9.2, the No Project Alternative would be compatible with the surrounding uses and consistent with adopted land use plans and policies. Current mining activities would continue as permitted until Mine closure in 2001. Actions pertaining to the Mine Expansion would not occur.

Both the Proposed Action and No Project Alternative are consistent with Land Use Objectives specified in Section 4.1.9.2, and consistent with the California Desert Conservation Area Plan. Therefore, the No Project Alternative would not avoid any significant land use impacts.

4.3.10 Recreational Resources

Similar to the Proposed Action described in Section 4.1.10, the existing mining operations do not significantly impact recreational resources within the project vicinity. Therefore, the No Project Alternative would not avoid any significant impacts to recreational resources.

4.3.11 Visual Resources

The No Project Alternative would result in overburden/interburden and heap leach piles as shown in Section 4.1.11. Visual impacts of the No Project Alternative would not be significant, as described in Environmental Solutions, 1987. As described in Section 4.1.11, the Proposed Action would not result in a significant impact. Therefore, the No Project Alternative would not avoid any significant visual quality impacts.

4.3.12 Environmental Health and Public Safety

The discussion for environmental health and public safety for the No Project Alternative is similar to the Proposed Action discussed in Section 4.1.12. The No Project Alternative would continue mining operations no longer than through the middle of the year 2001. Measures for mitigating potential health and safety impacts to Mine employees resulting from mining activities were established at the beginning of Mine operations in 1984. Procedures for handling and discharge of explosives are delineated by the Mine Safety and Health Administration (MSHA) and the Newmont Safety manual. Explosives are stored in a secured powder magazine constructed and maintained in accordance with Federal and local permit requirements. Impacts to the public and Mine employees resulting from generation of domestic and industrial wastes are not expected. Regulations and guidelines for proper disposal, handling and management of domestic and industrial wastes are set forth by County and State agencies. The Newmont Safety manual also provides internal procedures for generation of domestic and industrial wastes. These regulations and guidelines have been observed by the Mine since operations began in 1984.

Potential health and safety impacts to the public and Mine employees resulting from reclamation activities are not expected. Newmont has created a detailed, encompassing site Closure Plan for the Mine. The Closure Plan has been prepared to satisfy requirements of Section 2574, Article 7 of the CCR (Shepherd Miller, Inc., 1998). A complete Closure Plan can be found in the Consolidated Plan of Operations. Therefore, the No Project Alternative would not avoid any significant environmental health and public safety impacts.

4.3.13 Socioeconomics

As described in Section 4.1.13, the Proposed Action would result in the addition of approximately 20 to 30 full-time positions and the continuation of mining operations until the year 2006. This provision of employment and extension of mining operations would contribute to the local economy through personal income, sales tax, and other governmental revenues. Additionally, the Proposed Action would maximize the extraction of mineral resources that would contribute to the County's economic strength through royalties and tax revenues. The No Project Alternative would result in earlier closure of the existing Mesquite Mine, resulting in the loss of potential economic benefits including employment, income, and government revenues.

4.3.14 Public Services and Utilities

Mesquite Mine is a permitted, open functioning mine with adequate public services and facilities in place to serve the existing mine operations. As described in Section 4.1.14, the Proposed Action would result in no significant impacts to public services and utilities. Therefore, the No Project Alternative would not avoid any significant public services and utilities impacts.

4.3.15 Conclusion

The No Project Alternative is environmentally superior to the Proposed Action because it would avoid significant impacts to biological resources, including the threatened desert tortoise, fairy duster, Department of Fish and Game jurisdictional streambed, and any Army Corps of Engineers jurisdictional Waters of the United States. However, the No Project Alternative would conflict with the basic objectives of the Proposed Action; which is to profitably recover as much of the precious metals within the project mine area as possible, in conformance with the 1872 Mining Act. Not only would the No Project Alternative reduce conformance with the 1872 Mining Act, but it would result in premature termination of mining activities when recoverable, economically viable ore deposits have been identified adjacent to the existing mine boundaries. This would result in associated loss of mine-related employment and revenue to the County of Imperial, State of California, and BLM (e.g., leases, permits, royalties, sales taxes, etc.) that would otherwise occur with the Proposed Action.

4.4 CUMULATIVE EFFECTS

4.4.1 Scope of Cumulative Impacts

Pursuant to CEQA and NEPA, this chapter addresses the potential for cumulatively significant effects on environmental resources that could result from the implementation of the Proposed Action and other past, present and reasonably foreseeable future projects in the general vicinity of the project site.

The State of California CEQA guidelines define cumulative impacts as:

> "two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts. The individual effects may be changes resulting from a single project or a number of separate projects. The cumulative impact from several projects is the change in the environment which results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time." (14 CCR 15355)

A cumulative impact is defined under federal regulations as:

> "the impact on the environment which results from the incremental impact of the action when added to other past, present and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individual minor but collectively significant actions taken place over a period of time." (40 CFR 1508.7)

The following elements of the human environment could be potentially subject to cumulatively significant impacts, based upon the analysis of the environmental resources discussed in Chapter 4 of this EIR/EIS and identification of the cumulative projects described in Section 4.4.2,

- Water Resources
- Biological Resources (primarily associated with desert tortoise habitat),
- Transportation
- Air Quality, and
- Visual Quality

These potential cumulatively significant effects are each analyzed in Section 4.4.3. Although project-specific impacts may occur from each of these projects to other environmental resources (geology/soils/minerals, noise, cultural, paleontology, land use, recreation, and public services and

utilities), impacts would not be cumulatively significant and therefore are not further discussed in this chapter. Some project-specific impacts were not considered to be significant on an individual basis, but may contribute to a cumulatively significant effect. These topics are further discussed in Section 4.4.3.

As noted in Section 1.6.2.2, the California State Land Commission (CSLC) is concurrently processing a lease application for mineral extraction on the 657.85 acres of land under CSLC jurisdiction located north of existing Big Chief Pit. This area is frequently referred to as the "two north half-sections." According to CSLC representatives, mining or ancillary disturbance would only be allowed on the 97 acres that are part of the Proposed Action and the Reduced Footprint Alternative. Impacts to resources on those 97 acres are discussed in this EIR/EIS.

Section 4.4.4 of this EIR/EIS briefly describes the environmental resources on the 561 acres of the two north half-sections that are the subject of the CSLC mineral extraction lease but are not proposed for mining or exploration activities at this time. Approval of the mineral extraction lease by CLSC would not allow disturbance of any resources on the remaining 561 acres of the two north half-sections with future permits being issued by Imperial County. Issuance of these permits would be a discretionary action subject to the environmental review requirements of CEQA. In the event that federal actions are required, such as impacts to jurisdictional Waters of the United States, or the federally-listed desert tortoise, federal permits would also be required. Issuance of federal permits would be federal actions subject to the environmental review requirements of NEPA.

4.4.2 Description of Cumulative Projects

The individual projects described below comprise of the past, present, and reasonably foreseeable future projects with a potential to contribute to cumulatively significant environmental effects. Where appropriate, the cumulative projects have been grouped into land use categories such as mining, transportation and water conservation. Locations of the cumulative projects are shown in Figure 4.4-1. Cumulative projects addressed in this EIR/EIS include the following:

- Mesquite Regional Landfill (approved but unbuilt)
- Imperial Project Mine
- Existing American Girl Mining Complex and Oro Cruz Project
- Picacho Mine (to be closed and reclaimed)
- State Route 7 (Caltrans)
- State Route 111 and 111 North (Caltrans)
- All American Canal Lining Project
- Military Uses (ongoing)
- Recreational Uses (ongoing)

Environmental documents for the cumulative projects that were used in preparing this cumulative analysis are available for review at the Imperial County Planning/Building Department, 939 Main Street, El Centro, CA 92243, or the El Centro Area Office of BLM, 1661 South 4th Street, El

Centro, California, 92243. The Imperial Project Draft EIR/EIS, November 1997 (EMA, Inc.) was used as a source for information about many of the cumulative projects.

4.4.2.1 Mesquite Regional Landfill

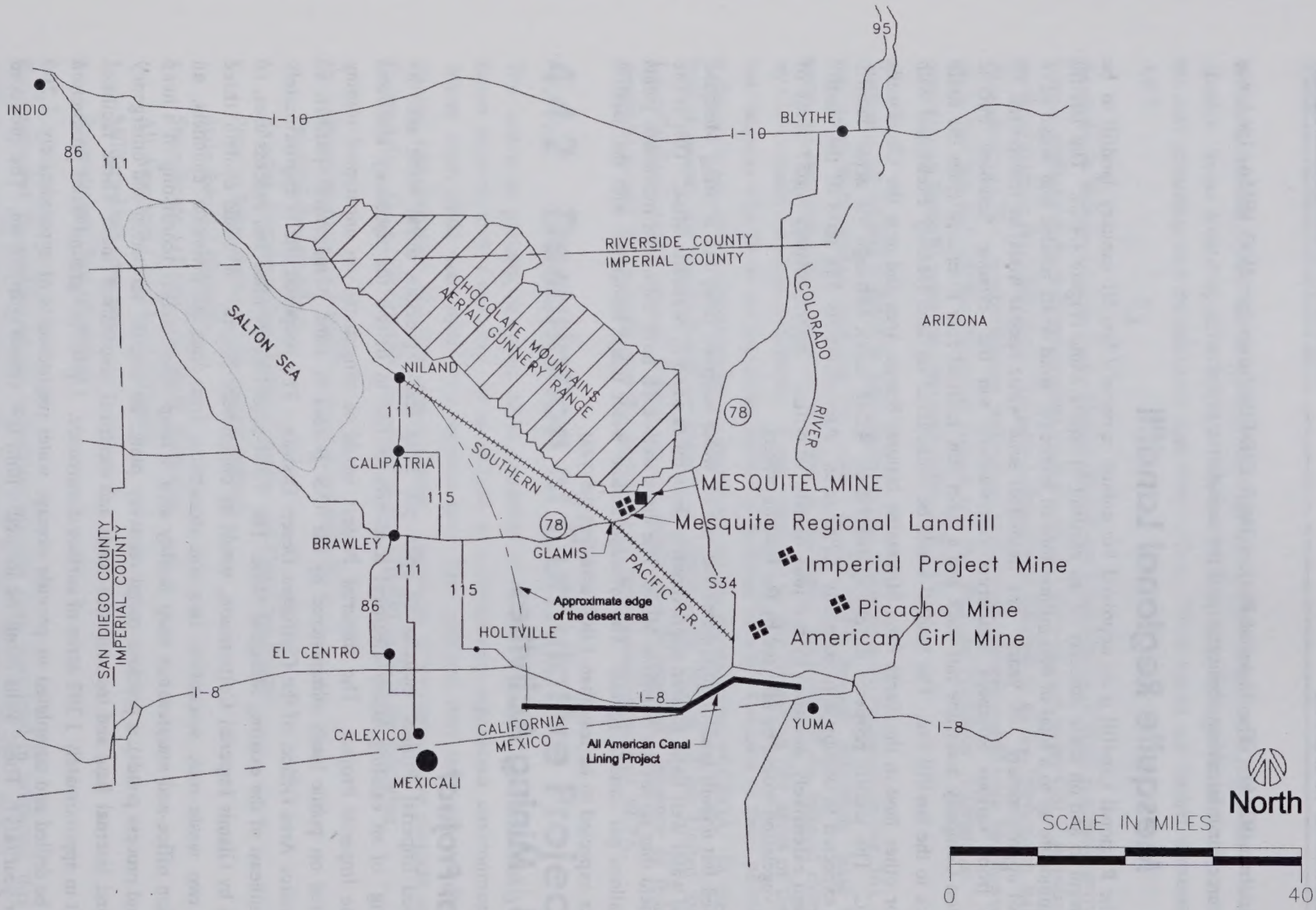
The Mesquite Regional Landfill is an approved but unbuilt regional Class III sanitary landfill to be located adjacent to and on some property of the existing Mesquite Mine (Figure 4.4-2). The landfill would accommodate up to a total of 600 million tons of municipal solid waste residue and would have a life span of approximately 100 years. The municipal solid waste residue would be transported to the landfill from various Southern California communities via the existing Southern Pacific Transportation Company main line rail track and a short new railroad spur extending from the main line rail track to the landfill site. The landfill would be constructed on land recently exchanged with the BLM for other land in the Santa Rosa Mountains Natural Scenic Area and near the Chuckwalla Bench ACEC. The landfill property covers approximately 4,245 acres, although the actual landfill footprint is expected to occupy approximately 2,290 acres. Approximately 588 acres of the landfill site have been extensively disturbed by previous on-site activities. Approximately 3,657 acres of undisturbed vegetation would be affected by the landfill project.

The approved but unbuilt landfill anticipates the use of water supplied from the existing Mesquite Mine ground water well field, located approximately three miles south of Mesquite Mine. This is the same well field that serves the Mesquite Mine. The three wells each have estimated maximum yields of 2,500 gallons per minute (gpm). The average annual water usage associated with the landfill operations is expected to be less than 1,000 acre-feet per year.

4.4.2.3 Mining Activities

Imperial Project

The proposed Imperial Project includes an open pit, heap leach, precious metal mine and the "overbuilding" of an existing utility electrical transmission line to deliver the necessary electrical power to the Imperial Project. The Imperial Project would be constructed on unpatented mining claims located on public lands administered by the U.S. Bureau of Land Management (BLM), El Centro Resource Area Office, of the California Desert District. The proposed site is approximately 12 miles southeast of the existing Mesquite Mine. The 1,571-acre Project mine and process area, to be operated by Glamis Imperial Corporation, would be completely fenced. It would contain three open pits, two waste rock stockpiles, two soil stockpiles, five drainage diversion channels, an administration office and maintenance shop facility area, a heap leach facility (consisting of a heap leach pad and process ponds), a precious metal recovery plant, an electric substation and emergency generator, and internal haul and maintenance roads and electrical distribution lines. These facilities would result in approximately 1,302 acres of surface disturbance. Up to four ground water production wells would be drilled and completed to provide average water requirements of approximately 1,200 acre feet per year (afy). These wells would be located within the Amos-Ogilby Basin. The produced ground water would be pumped to the Project mine and process area via a buried pipeline.



SOURCE: Newmont Mining Corporation, 2000

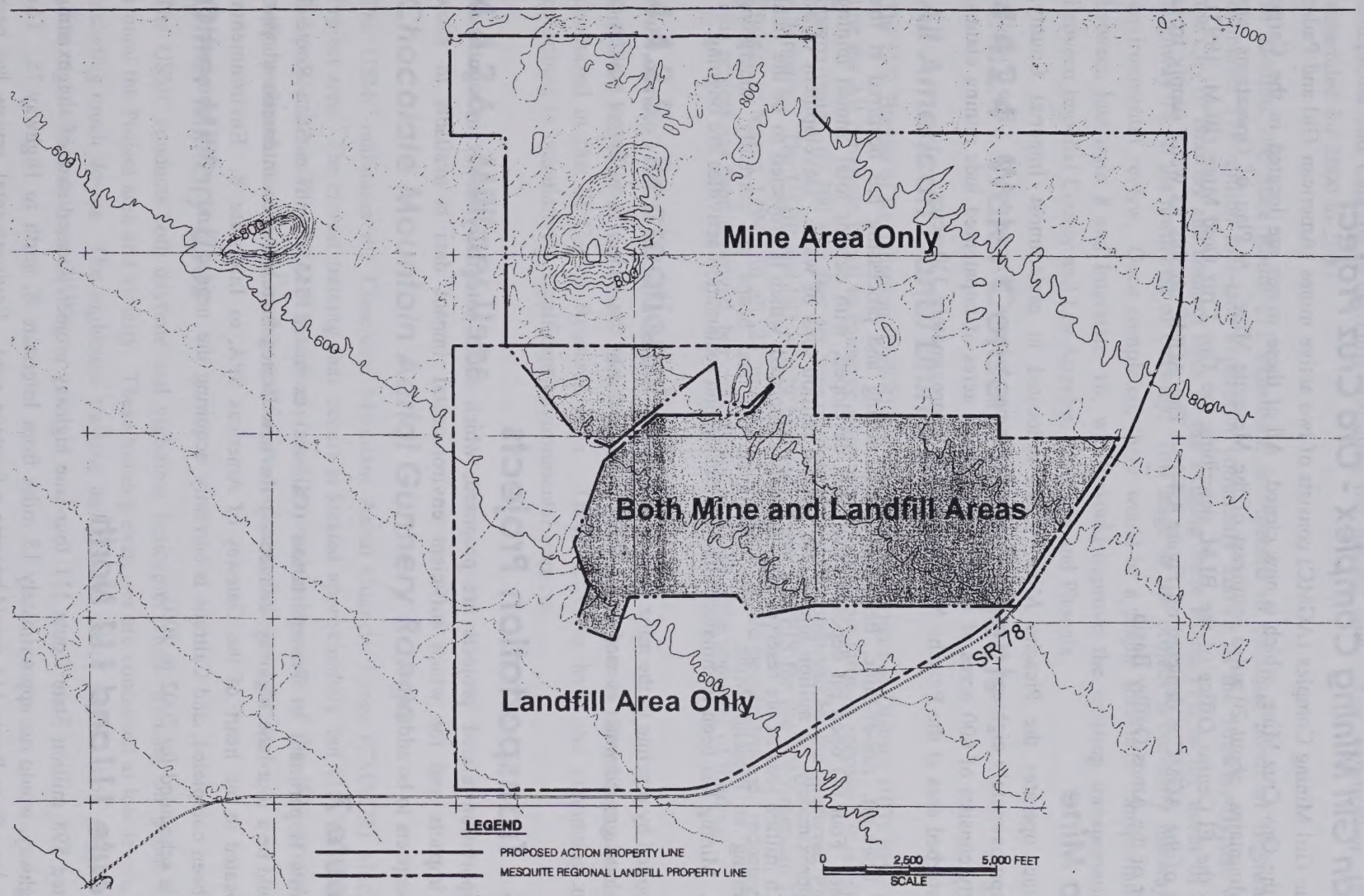
7/7/00

BRG CONSULTING, INC.

Mesquite Mine Expansion EIR/EIS

Locations of Cumulative Projects

FIGURE 4.4-1



SOURCE: BRG Consulting, Inc., 2000.

3/17/00

4.4-5

BRG CONSULTING, INC.

Mesquite Mine Expansion EIR/EIS

Property Boundaries of Proposed Action and Mesquite Regional Landfill

FIGURE 4.4-2

American Girl Mining Complex - Oro Cruz Project

The American Girl Mining Complex (AGMC) consists of two active mines (American Girl and Padre Madre) and the Oro Cruz Mine, which is now closed. All of these mines are located in the Cargo Muchacho Mountains, about 20 miles southeast of the Mesquite Mine. A Plan of Operations was submitted to the El Centro Office of the BLM, describing the Oro Cruz Gold Mine (BLM, 1993). The location of the AGMC is depicted on Figure 4.4-1. The AGMC obtains its water supply from the perimeter of the Amos-Ogilby Basin.

Picacho Mine

Chemgold, Inc. operates the Picacho Mine, which is located in easternmost Imperial County, California, approximately eighteen (18) miles north of Yuma, Arizona (Figure 4.4-1). The Picacho Mine property consists of 600 acres of fee lands and 1,650 acres of unpatented lode mining claims. The total disturbed area at the Picacho Mine amounts to approximately 330 acres.

Since 1980, open-pit, run-of-mine, heap leach gold mining and processing has occurred at the Picacho Mine. Four (4) open pit deposits have been developed, with current total annual mining averaging approximately 1.5 million tons of ore and 7.0 million tons of waste. Development of an additional 3.6 million tons of ore reserves is now nearly completed, which is projected to be the final phase of mining at Picacho Mine. The completed pits and heaps are currently undergoing reclamation. Mining has been terminated, although rinsing and reclamation activities are ongoing.

Water is supplied by pipeline to the mine from a shallow well located adjacent to the Colorado River aquifer. No local ground water is used at the Picacho Mine due to the lack of a sufficient aquifer in this location.

4.4.2.3 Transportation Projects

Three transportation-related projects are proposed, which could potentially result in significant cumulative impacts and for which sufficient environmental impact data is available to allow cumulative impacts to be addressed.

State Route 7

The California Department of Transportation (Caltrans) estimated $53.8 million State Route 7 project, would be a four-lane highway, connecting the new United States/Mexico international port of entry, located in the heart of the Gateway of Americas SPA, to Interstate 8. Environmental review has been completed, and Caltrans is currently acquiring the needed land. The construction time frame is scheduled for 2002 to 2003.

State Route 111and 111 North

The estimated $98 million State Route 111 four-lane highway project, located east of the existing two-lane highway, would run approximately 15 miles from Interstate 8, north to Highway 78. The existing two-lane State Route 111 would become a frontage road. Environmental review has been

completed and Caltrans is currently acquiring the needed land. The construction time frame is scheduled for 2000 to 2003.

In addition, the State Route 111 expansion is expected to continue north of Highway 78. This estimated $75 million four-lane expansion commonly known as the Brawley-Bypass would bypass the City of Brawley and connect back to the existing State Route 111, to the north of Brawley and Highway 78, to the northwest of Brawley. This stage of the project is currently midway though the environmental review. Once completed, there would be a major four-lane transportation corridor between Interstate 8 and Interstate 10, which would improve the existing transportation network between Imperial County and Los Angeles, Riverside and Phoenix.

4.4.2.4 Water Conservation Projects

All American Canal Lining Project

The U.S. Bureau of Reclamation (USBR) and the Imperial Irrigation District (IID) have proposed to line the All American Canal to conserve water that is being lost through seepage. It is estimated that approximately 67,700 acre-feet per year of water would be conserved by the preferred Parallel Canal Alternative. The USBR and IID jointly released a Final EIR/EIS for the All American Canal Lining Project in March 1994. In all, 23 miles of lined canal would be constructed, reducing water loss. This project has been approved, but construction is pending the approval of funding.

4.4.2.5 Recreational Uses

Dispersed recreational activities, including OHV uses, hunting, rock hounding, and camping, are conducted in the El Centro Resource Area. These activities have the continuing potential to contribute to cumulatively significant environmental impacts.

4.4.2.6 Military Uses

Chocolate Mountain Aerial Gunnery Range

The USMC maintains the Chocolate Mountain Aerial Gunnery Range (CMAGR) which abuts the Project area. The closest training that occurs is located approximately ten (10) miles northwest of the project area. The CMAGR is actively used by various branches of the U.S. Armed Forces for military aircraft training and testing and for live ordnance delivery practice.

Other Military Uses

The USMC conducts both daytime and nighttime helicopter flight training on public lands in and around the Project area and vicinity. These training exercises are conducted at low-levels, sometimes including touch downs. The nighttime training includes the use of night vision goggles (NVG) and other night vision devices (NVD).

Two (2) military Visual Flight Rule (VFR), low-level flying routes for fixed wing aircraft are also located in the vicinity of the Project. VFR-299 (445th Military Airlift Wing-March Air Force Base) and VFR-1266, -1267, and –1268 (Marine Air Group-13-MCAS Yuma) each consist of six (6) ±-mile wide flight corridors, which are used by fixed-wing military aircraft during training or travel.

4.4.3 Cumulative Impacts

4.4.3.1 Water Resources

The Proposed Action, the Mesquite Regional Landfill, the Imperial Project, and the lining of the All American Canal have the potential to contribute to cumulatively significant water resources impacts, based on their potential effects on water supply in the Amos-Ogilby Basin. The annual consumption of ground water by all of the cumulative project wells together is a relatively small percentage (less than twenty percent) of the gross estimated recharge to the Amos-Ogilby-East Mesa Basin. The All American Canal Lining Project, if constructed, would probably result in an estimated reduction in recharge to the basin of 6,770 afy (two-thirds) of the 10,000 afy assumed to seep into the Amos-Ogilby-East Mesa Basin). However, even with this reduction, the net recharge to the Amos-Ogilby-East Mesa Basin would still exceed the cumulative ground water consumption from the identified projects and uses. The All American Canal Lining Project is currently on hold and has no schedule for implementation. The maximum total estimated cumulative annual consumption of ground water by the cumulative projects within the Amos-Ogilby-East Mesa Basin represents approximately 0.003 percent of the estimated ground water stored in the Amos-Ogilby-East Mesa Basin (or approximately 0.005 percent of the estimated ground water stored in the Amos-Ogilby Basin alone). Based upon ground water drawdown estimates observed for the Mesquite Mine well field wells alone (see Section 4.1.2), and because these cumulative projects are widely scattered and the ground water consumption distributed, there should be no significant interference between the projects from their individual uses of the ground water resources. Cumulative effects would not be significant, and no mitigation measures are recommended. This discussion includes cumulative impacts to water usage, infiltration and runoff, and water quality.

The combined water use from the Mesquite Mine and landfill projects would not exceed the currently permitted maximum withdrawal rate from the well field. In addition, the Amos-Ogilby Basin would continue to experience a net recharge, even with reduced recharge due to the All American Canal Lining Project. Cumulative impacts to water resource usage would not be significant.

The mine and landfill projects, when combined together, would not negatively alter infiltration or runoff patterns because they do not substantially increase the amount of impermeable surfaces in the area. Impacts to flows of surface water would not be significant.

Cumulative impacts to water quality would also be minimal. After approximately 15 years of the mining operations and the use of cyanide at Mesquite Mine, there has been no spill or accidental leak from the project. No change in mine operations that would adversely affect water quality is planned

or anticipated. Thus the Proposed Action would have no effect on cumulative water quality. Cumulative impacts to water quality therefore are not significant.

4.4.3.2 Biological Resources

Plant and wildlife habitat would be incur cumulative effects from the identified projects. Surface disturbance within the respective project areas would result in a direct loss of habitat. In addition, the quality of habitat in neighboring areas would be indirectly impacted by project noise, surface disturbance, dust, and other off-site intrusions. Direct habitat loss impacts can be quantified, but indirect biological impacts are much more difficult to assess as they vary with site-specific conditions and the sensitivity of the species that occur in the respective habitat types impacted. A distinction can also be made between the cumulative temporary losses of habitat that is removed over the active life of project activities but that can be reclaimed after project activities have been completed, and permanent losses of habitat that remain indefinitely at the end of project activities and after the respective project sites are closed and reclaimed. Direct and indirect, temporary and permanent, and cumulative impacts result from the existing and reasonably foreseeable projects identified.

The cumulative surface disturbance from all of the identified mine projects would total approximately 7,859 acres. The approximate areas of surface disturbance from the Regional Landfill is 3,657 acres. The combined concentrated areas of surface disturbance total approximately 11,516 acres of desert vegetation and wildlife habitat that is or would be unavailable over the respective lives of these projects. However, these individual projects in the cumulative impact analysis are dispersed over a regional area at least 35 miles long by 25 miles wide (approximately 900 square miles, or nearly 600,000 acres) in which large vacant tracts of land, with similar vegetation and wildlife habitat remain.

Dispersed recreation and military uses of the area put added pressure on wildlife species, in particular on game species and on wildlife intolerant of human activities. Dispersed recreation and military uses of the area also adversely impact vegetation and habitat over wide, unconcentrated areas. However, most of these dispersed activities are intermittent and/or temporary.

Microphyll Woodland Habitat

Concern exists over the continuing loss of wildlife habitat, in particular the loss of microphyll woodland habitat which exists in the desert washes that cross much of the desert area. Because of the limited forage and cover available in the alluvial flats and uplands between the wash systems, the microphyll woodland habitat is necessary for the success of many species that occur in the area. Microphyll woodland habitat is considered important by the CDFG and a necessary component of the ecosystem for the continuing success of deer and other sensitive species that utilize the habitat.

Cumulative impacts to other on-site habitat areas and sensitive species would occur, but would not be significant because the potentially-affected habitats (desert microphyll woodland and creosote brush scrub) and the associated foraging areas provided by these habitat areas are relatively small when compared to the total quantity of such habitat and foraging area in the cumulative area.

Aerial photographs of the general area were used to grossly estimate the amount of microphyll woodland habitat within the local desert area. It was found that approximately four to eight percent of the 600,000 acres (i.e., about 23,000 to 46,000 acres) evaluated in this cumulative impact analysis may be microphyll woodland habitat. Assuming that, on average, a comparable proportion (i.e., four to eight percent) of the microphyll woodland habitat is directly impacted by surface disturbance within the areas of the combined cumulative projects, then a total of approximately 460 to 520 acres of microphyll woodland has been or would be lost to the cumulative projects. Because each individual cumulative project would be required to implement appropriate mitigation and compensation measures (such as those contained within a CDFG Stream Alteration Agreement), this cumulative impact on microphyll woodland habitat is considered below a level of significance.

The cumulative indirect impacts resulting from the identified cumulative projects are expected to be proportionately the same as those described for the Project, and would also be expected to be similar regarding the temporary loss of habitat occurring over the life of the cumulative projects and the permanent loss of habitat after each of the cumulative projects had been closed an the area reclaimed.

Existing higher-quality desert habitat would be preserved off-site, through compensation for the loss of desert tortoise habitat. This would benefit not only desert tortoise, but other native wildlife/plant species as well. Furthermore, the listed projects are far enough apart that the cumulative impacts would not occur to one localized population.

Wildlife

Threatened and Endangered Species

Desert Tortoise

The Proposed Action, the Mesquite Landfill and the American Girl Mine are all located in a BLM Category III desert tortoise habitat area. The Proposed Action also affects Category II habitat. Category III areas are not considered essential to maintenance of viable populations (i.e., critical habitat), have relatively low tortoise densities, and have unresolvable conflicts between habitat and land uses (U.S. DOI, 1988). The total acreage of Category III habitat potentially disturbed by the projects cannot be determined at this time because the area of impact from the AGMC are unknown. Approximately 355-421 acres of potential desert tortoise habitat (BLM Category II and III) would be disturbed as a result of the unpermitted proposed mine expansion. This project-related loss would potentially contribute to a significant cumulative impact when considered with the Mesquite Landfill and AGMC projects. Because the desert tortoise is a federally threatened, as well as state-listed species, any potential take would require consultation with USFWS under Section 7 of the Federal Endangered Species Act, and contact with CDFG under CESA. The established mitigation measure for impacts to desert tortoise habitat is compensation through the acquisition and transfer to federal ownership of higher quality habitat. The mitigation measures implemented would include at a minimum various combinations of the following types of activities:

- Initial site clearance and relocation of desert tortoise by a trained person;
- Fencing to preclude reentry;
- Construction and operations worker and visitor training;
- Provisions to minimize the attraction of tortoise predators (e.g., ravens);
- Off-site compensation by transferring ownership of privately-owned Critical or Category I habitat land to federal ownership and protection based on a ratio formula designated by the BLM in consultation with the USFWS; and/or
- Speed controls for unfenced access roads.

These measures are all being required for the proposed Mine expansion. Mitigation through the Section 7 process would ensure that project-related cumulative impacts to desert tortoise habitat would be reduced to below a level of significance.

Other Special Interest Species

Mammals

MULE DEER

Although the Proposed Action would decrease available acreage of forage for mule deer (and other animals) in the region, the amount lost (52 acres) is considered *de minimus* in relation to the estimated acreage of microphyll woodland habitat in the region, from 23,000 to 46,000 acres. Thus, cumulative impacts to mule deer habitat are considered less than significant.

BIGHORN SHEEP

The discussion above on mule deer is applicable to bighorn sheep as well. Cumulative impacts to bighorn sheep habitat are considered less than significant.

Bats

The area is suitable for foraging by numerous bat species. Roosts of sensitive bats were located nearby. High-quality microphyll woodland occurs between these roosts and Mesquite Mine, and the bats would be expected to use habitat closer to their roost sites much more often. Cumulative impacts to bats are considered less than significant.

Birds

PRAIRIE FALCON

Project area habitats are considered potential foraging areas for prairie falcon. Only a small fraction of open desert habitats will be disturbed by the cumulative projects. This level of disturbance is *de minimus*, and is not considered to be cumulatively significant.

BURROWING OWL

Suitable habitat for the burrowing owl (*Athene cunicularia*) is present within the proposed expansion areas. Based on the fact that the habitat found within the proposed expansion areas does not exhibit any unique characteristics and is a small percentage of the available habitat surrounding the Mesquite Mine, this level of disturbance is *de minimus* and is not considered to be cumulatively significant.

Amphibians – Couch's Spadefoot Toad

No direct or indirect impacts to nearby populations of Couch's spadefoot toad are expected as a result of the Proposed Action. Therefore, the Proposed Action will not contribute to cumulative impacts to this species.

Reptiles – Western Chuckwalla

Less than 3 acres of potential habitat for the western chuckwalla exists within the Mine expansion area. No significant direct impact was identified. Existing higher-quality desert habitat would be preserved off-site through compensation for loss of desert tortoise habitat. It is expected that the compensation lands for the Proposed Action and cumulative projects will contain chuckwalla habitat. Impacts to the western chuckwalla would be less than significant, on both direct and cumulative bases.

Plants

The proposed mine expansion would result in loss of up to 50 plants of one known sensitive plant species (fairy duster) from CNPS List #2, and loss of potential habitat for three other species from CNPS List #4 (slender lobed 4 o'clock flower, winged cryptantha, and ribbed cryptantha). The potentially-significant direct impacts would be reduced to less than significant, through application of the following mitigation measures:

- installation of microcatchment areas to aid in seed germination;
- scarification of applicable disturbed areas to facilitate natural plant propagation;
- collection and use of seeds from plants on and adjacent to Mesquite Mine property;
- salvage and transplantation of mature fairy duster plants into reclaimed areas;
- use of cuttings from local fairy duster plants to increase plant numbers; and
- preservation of compensation lands containing fairy duster plans.

The other cumulative projects are required to implement similar mitigation measures. Cumulative impacts are considered less than significant, with implementation of the mitigation measures required for the Proposed Action and cumulative projects.

For these reasons, the Proposed Action would not result in a significant cumulative impact to biological resources.

4.4.3.3 Transportation

The analysis of cumulative highway impacts was limited to SR 78 west of the Imperial Sand Dunes Recreation Area (ISDRA). Very little project-related traffic would travel east on SR 78. Therefore, cumulatively significant impacts would not occur east of the project area. Project-related traffic west of Glamis would travel to various communities in western Imperial County, Riverside County, and beyond. Project traffic west of Glamis is expected to disperse quickly (i.e., turn off onto other roads heading for varying destinations). The Proposed Action would generate a negligible amount of additional traffic over what is currently existing, because the Proposed Action would extend current levels of Mine traffic for an additional six years. Additionally, traffic generated from the other cumulative projects would not be concentrated on any given road. Therefore, cumulative transportation impacts would not be significant.

4.4.3.4 Air Quality

Direct air quality impacts of the Proposed Action were found to be less than significant, and the projected emissions would meet all applicable federal, state, and ICAPCD rules and criteria.

Potential cumulative air quality effects depend on the spatial distribution of the projects listed in Section 4.4.2, and the periods of time over which these projects would be constructed and operated. The only project that is close enough to the Proposed Action to possibly cause significant cumulative effects is the proposed Mesquite Regional Landfill (Landfill), which is described briefly in Section 4.4.2.1 and in detail in its Final EIR/EIS (BRG, 1995).

The sites of the Landfill and Proposed Action physically overlap, as shown in Figure 4.4-2. However, the time periods for construction and operation of these two projects would probably not overlap. The Proposed Action is planned to continue operation of the Mine through the year 2006. In contrast, construction of the Landfill will not begin until contracts are obtained by Arid Operations, Inc. for disposal of municipal solid waste (MSW). It is anticipated that landfill operations would increase over several years, taking years to reach full operational level.

The most likely source of MSW for potential disposal at the Landfill is the County Sanitation Districts of Los Angeles County (Sanitation Districts). Three factors account for the expectation that operations at the two projects will not overlap to cause simultaneous air emissions. The first factor is that the Sanitation Districts forecast that they do not expect to send MSW to the Landfill before the period 2007-2013 because they have their own landfills with sufficient capacity for several years. The second factor is that other landfills in Orange and Riverside Counties are expected to offer lower cost disposal for many years. During this period of alternative low cost disposal, the Sanitation Districts are unlikely to ship MSW to the Landfill. The third factor is that the rate at which the Sanitation Districts might contract to ship MSW to the Landfill would increase much slower than the increase shown in the Final EIR/EIS. Instead of 4,000 tons per day (tpd) in the first year increasing to 8,000 tpd in the second, and 12,000 tpd in the third, it is expected that the first few years would be a constant disposal rate of 3,400 tpd.

Because of these factors, it is unlikely that air emissions from operating the Landfill will occur before air emissions from the Proposed Action have ceased. Hence, cumulative effects on air quality are not expected to occur.

4.4.3.5 Visual Resources

Each of the identified cumulative projects are located, at least in part, on or adjacent to public lands administered by the BLM within the CDCA. However, except for the immediately adjacent Mesquite Regional Landfill, no more than one of the cumulative projects is visible from any important viewing location at any one time. Direct visual quality impacts from the Proposed Action have been determined to not be significant (See Section 4.1.11).

When considered with the Mesquite Landfill development, impacts to visual quality would increase. The proposed landfill would encroach on to the existing heap leach pads in Area 16 as shown in Figure 2.1-1 in Chapter 2. The heap leach pads in that area would be used as soil cover for the landfill. The heap leach pads would thus become smaller, but would be superseded by adjacent mounds of Municipal Solid Waste, covered with material from the heap leach pads. There would be no change to the Mine OISAs. The proposed landfill would be directly adjacent to the southeastern edge of the Mesquite Mine project boundary, which lies within a few feet of SR-78. The proposed landfill would extend to heights of approximately 375 to 475 feet. The resultant form would be that of a large, contoured hill somewhat similar in texture but lighter in color than natural topographic features in the project vicinity. The landfill would cover an area of approximately three miles by one and one-half miles and would be a long-term, permanent change to the local visual environment. In addition, the landfill would not be consistent with BLM's Visual Resource Management System Guidelines because it would demand attention, would not be overlooked, and would be dominant in the landscape. Visual changes associated with the Proposed Action would add to these impacts. Cumulative impacts to visual resources are considered significant and unmitigable.

4.4.4 Environmental Resources Located on 561 Acres of the Two North Half-Sections

4.4.4.1 Introduction

This section briefly describes the environmental resources located on 561 acres of the two north half-sections that are not proposed for development as part of the Proposed Action. It is not possible to identify future environmental impacts to these resources because there is no proposal to disturb these lands at this time.

4.4.4.2 Environmental Resources

Geology/Soils/Seismic Issues – as with the Proposed Action, additional mine development in the two northern half-sections could potentially result in additional erosion or seismic impacts; however, like the proposed Mine expansion, it is anticipated that all such issues could be mitigated.

Water Resources – development of additional north half-section lands would not require that additional water resources be developed – the existing Mine well field would be adequate. No additional impacts to offsite groundwater quality or quantity are likely – there are no nearby beneficial uses or wells. Stream alignments meeting the ACOE definitions of "Waters of the U.S." were mapped in this area, and additional Mine development would likely result in impacts to ACOE and CDFG jurisdictional lands.

Biological Resources – most of the remaining area not incurring impacts from the proposed Mine expansion consists of creosote/desert pavement and upland succulent plant communities; however, there are some microphyll woodland areas in Section 6, and in the northeast part of Sec. 5, north of the proposed northern diversion channel. Two desert tortoise burrows or pallets were identified in a portion of Section 6 that was surveyed, but more than 250 acres were not surveyed for endangered species as part of the proposed Mine expansion. Given that situation, discussion of specific biological impacts of later Mine expansion would be speculative. However, as effective mitigation was identified for the Mine expansion proposed in this EIR/EIS, it is anticipated that biological impacts to additional expansion in the north half-sections could be mitigated as well.

Cultural Resources – based on 1987 studies, 8 sites in this area were recommended as eligible for inclusion in the National Register of Historic Places, and 3 other sites would require additional testing. Whether the National-Register eligible sites could be avoided, and if not, whether appropriate mitigation would be available, is considered highly speculative at this time, given that there is no plan for Mine development.

Paleontological Resources – no fossils were identified in the proposed Mine expansion areas, and none are anticipated in the balance of the two north half-sections. These areas contain the same geologic materials as the site of the Proposed Action: recent alluviums, conglomerates, granites and gneisses, none of them likely to contain fossils.

Transportation – impacts from any substantial additions to the current workforce would be considered highly speculative at this time, given that there is no plan or schedule for any such Mine expansion.

Noise – no additional noise impacts anticipated. Any possible future Mine expansion would have noise characteristics similar to the Proposed Action, and this area is far from sensitive receptors.

Air Quality – no changes to Mine operations and air quality mitigation measures are anticipated. However, as for the Proposed Action, cumulative PM_{10} (fugitive dust) impacts are considered likely.

Land Use – no additional land use impacts are anticipated. There are no nearby sensitive uses.

Visual – predicting the appearance of any rock mounds would be highly speculative; however, it can be stated that this area is located far from possible sensitive view points. As with the Proposed Action, cumulative visual impacts are possible.

Environmental Health and Safety – no changes in safety procedures would be likely. Current Mine operations comply with applicable laws and regulations. No impacts are anticipated.

Socioeconomics – development of any ore deposits outside the proposed Mine expansion would have social and economic benefits to personal income, taxes, and governmental revenues.

Public Services and Utilities – As with the Proposed Action, no new public investments would be required to provide such services. Therefore, no impacts are anticipated

5 Other Required Considerations

This chapter focuses on several specific effects of the Proposed Action, presented in a format required by the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA). These issues are:

- Growth-inducing effects of the Proposed Action.
- Irreversible and irretrievable resource commitments.
- Relationship between the short-term use of the environment and the enhancement of long-term productivity.

The information presented is based on more detailed discussions found in Chapter 4.0, Environmental Consequences.

5.1 Growth Inducement

Growth-inducing effects are those characteristics of a project that tend to foster or influence direct and indirect growth in its environs, or that create significant new demands for supporting services and activities.

The Proposed Action involves developing additional reserves to support ongoing mining operations, and would not require the extension or expansion of any utilities or services that could be used by other development. Based on the general absence of public utilities and services in the project area, it is not anticipated that the project could indirectly induce population growth through the provision of utilities.

The approved rate of mining would not change. However, the planned mine expansion may require an additional 20 to 30 permanent employees who are expected to come from Imperial County's labor pool. The expansion of the mine would not induce new residential, commercial or industrial development, either directly or indirectly.

Following closure of the mine, it is anticipated that many of the 167 present mine employees would continue to work at the site for the approved but unbuilt Mesquite Regional Landfill operation.

5.2 IRREVERSIBLE AND IRRETRIEVABLE RESOURCE COMMITMENTS

The proposed Mesquite Mine expansion will continue to result in irreversible commitments of some environmental resources. Extraction of gold reserves will gradually diminish the commercial values of the ore body at the Mesquite site until it is no longer economically usable at today's mineral prices. The land requirements for the Mesquite Mine would represent an irreversible commitment of an additional 142-190 acres of land because although all buildings will be removed upon the project's completion, the mine pits, overburden/interburden storage areas and heap leach facilities will permanently alter the physical character of the project site. Mitigation measures, particularly revegetation, would reduce the severity of these impacts. To enhance the visual compatibility of the mine site with the surrounding terrain, Newmont proposes to regrade certain sharp corners of OISAs and heap leach pads for visual impact mitigation purposes.

The reclamation plan includes enhancing visual resources in critical areas. Blending of the reclaimed landscape will be similar to adjacent areas within the foothills of the rugged and undulating Chocolate Mountains. Following the completion of reclamation, portions of the project area would be able to support land uses similar to those that existed prior to the Mine, although the changes would represent an irreversible commitment to the new landforms.

The Proposed Action would commit the use of non-renewable energy sources. The use of non-renewable energy sources associated with the continued mine operations include diesel fuel and propane for power production and mine operations, diesel fuel, gasoline, and oil for mining equipment and transportation vehicles. The Proposed Action and Reduced Footprint Alternatives would require some additional building materials for relocated structures. This commitment of resources, however, would be short-lived. At the cessation of mining, mine site facilities and equipment would be removed in accordance with the Reclamation Plan. Therefore, no significant irreversible and irretrievable commitment of non-renewable energy or materials is expected.

Mining activity is consistent with BLM and SLC land use policies. However, mining operations essentially precludes future non-mining uses much of on the project site (i.e., OHV recreation, hiking, rockhounding). The preemption of future uses is partially mitigated by the potential for future resource recovery from the mine pit, stockpiles and overburden/interburden storage areas.

5.3 RELATIONS BETWEEN THE LOCAL SHORT-TERM USE OF THE ENVIRONMENT AND THE ENHANCEMENT OF THE LONG-TERM PRODUCTIVITY

Principal uses of the project site, as established by previous activities, and as provided by the Imperial County General Plan and BLM California Desert Conservation Area (CDCA) Plan, include mineral exploration and extraction. The Proposed Action would result in additional surface disturbances of 190 acres at the existing Mesquite Mine. This would result in a cumulative impact of 5,151 acres of surface-disturbing activities over the approximate 20-year mine life (through the year 2006 or longer, depending on economics). The Reduced Footprint Alternative would result in additional surface disturbances of 142 acres at the existing Mesquite Mine. This would result in a cumulative impact of 5,104 acres of surface-disturbing activities over the mine life. The project site could continue to be used for mining activities as the approved, but unbuilt Mesquite Mine Regional Landfill, is constructed, and portions would remain available for reduced value as wildlife habitat. Long-term and cumulative impacts would be predominately associated with these surface disturbances, and restricted to the mine and landfill site area.

Benefits resulting from this short-term use of the environment for the proposed continuation of mining activities are primarily socioeconomic. Approximately 167 people are currently employed at the mine. Project-related employment, direct and indirect expenditures associated with ongoing mining activities, and government revenues would contribute to the viability of the local and regional economy for an additional 6 years or longer depending on economics beyond the currently permitted operations. Continued operation benefits the regions' economy; county, state, and federal governments through taxes and fees; and investors of the publicly-owned mining company. Development of mineral resources is also in the national interest to help satisfy industrial and security needs.

The Proposed Action would also contribute to the long-term enhancement of desert habitat. Lands to be acquired for impacted Category II or III desert tortoise habitat must be compensated with Category I or II of the same desert tortoise management unit, at a sufficient ratio under BLM requirements and in accordance with the desert tortoise recovery plan. As a result, the lower quality, Category III desert habitat would be replaced with higher quality habitat which would be preserved for long-term benefits. This would enhance long term productivity.

The project area has historically been used primarily for mining activities. Approval of the Mesquite Mine in 1985 further committed this site to a mining use. The commitment of the additional 142-190 acres, therefore, would do little to narrow the range of other beneficial land uses of this site. Continued operation would not substantially delay planned reclamation, because, concurrent reclamation is ongoing.

The primary cumulative and long-term effect of the project is the change to the landscape, altering the site aesthetics. Although mitigations are planned to reduce this effect, the landscape will be permanently altered. Long-term risks to public and safety are also recognized, but plan to be minimized through design features. However, steep mine pit slopes that will remain following closure and reclamation could be hazardous to future recreationists who violate safety warnings. High berms will be constructed around all Mine pits during reclamation, and vehicular access into the pits will be blocked by removing sections of access road into the pits. It is currently planned that Mine perimeter fencing would be removed at the completion of reclamation, but selected fence sections could be retained, at the discretion of BLM, if considered helpful in maintaining public safety. Proper reclamation and the remote location of the site minimize public safety risks.

Following the operation period, the mining pits would remain so that future mineral extraction could occur, if economically feasible.

The employment, expenditures, and tax revenue would benefit local citizens by providing income that could be invested by individuals. Also, project-related tax revenues to the cities and County could be invested in infrastructure and other vehicles to provide for the economic and environmental productivity of the County, cities, and citizens.

In providing these economic, social, and environmental benefits, the Proposed Action would enhance the long-term productivity and economic well-being of Southern California in general, and Imperial County in particular, while not precluding the long-term use of much of the site for other valuable activities. By transferring ownership of privately held desert tortoise critical habitat to the federal government, the long-term productivity of public lands would be enhanced.

6 Consultation and Coordination

6.1 SCOPING AND NOTICE OF INTENT/NOTICE OF PREPARATION

The County of Imperial and the U.S. Bureau of Land Management (BLM) provided for a number of opportunities for early consultation and public comments on the environmental issues that should be addressed in this Environmental Impact Statement/Environmental Impact Report (EIR/EIS). These opportunities included circulation of a Notice of Preparation (NOP) in December 1998, publication of a Notice of Intent (NOI) in December 1998, and public and agency "scoping meetings" in January 1999. The results of these activities are briefly summarized as follows:

1. The initial identification of general areas of environmental impacts to be addressed by this EIR/EIS are documented by an Initial Study prepared by the Imperial County Planning Department according to the County's Rules and Regulations to Implement California Environmental Quality Act (1991). The Environmental Initial Study and accompanying Environmental Discussion for the proposed Mesquite Mine Expansion are included in Appendix A-2 of this EIR/EIS.

2. The County of Imperial mailed an NOP to approximately 65 individuals and agencies on December 14, 1998. The NOP was distributed to known interested individuals and organizations as a notice of early consultation, as well as to known responsible agencies (State California Environmental Quality Act (CEQA) Guidelines Section 15082). Although the State CEQA Guidelines establish a 45-day comment period for the NOP, responses were received and considered through the month of February, 1999. A total of 6 letters were received in response to the NOP. Copies of the NOP, mailing list and responses are contained in Appendix A-2.

3. The BLM published a NOI to prepare a joint Federal-State EIR/EIS in the Federal Register on December 18, 1998 (40 Code of Federal Regulations (CFR) Part 1508.22). The NOI was distributed to known interested individuals and organizations as a notice of early consultation, as well as to known responsible agencies. The BLM's *National Environmental Policy Act Handbook* establishes a 30-day comment period for the NOI, therefore, responses were

received and considered through February 8, 1999. A total of nine letters were received in response to the NOI. Copies of the NOI, mailing list and responses are also contained in Appendix A-2.

4. Three community scoping meetings were conducted on January 26, 27 and 28, 1999. The purpose of these public meetings was to solicit and receive public input on the environmental concerns that should be addressed in the EIR/EIS being prepared by the BLM and the County of Imperial for the proposed new Mesquite Mine Expansion. The meetings were conducted by the BLM. A brief informational presentation was followed by approximately two hours of discussion by members of the community who attended the meetings and enumerated their concerns.

   The first community scoping meeting was held at the Best Western Inn Suites in Yuma on January 26, 1999 at 7:00 p.m. Approximately 40 people were in attendance, and about 29 people spoke.

   The second scoping meeting was held at the El Centro Community Center on January 27, 1999 at 7:00 p.m. Approximately 26 people were in attendance, and about 15 people spoke.

   The third scoping meeting was held at San Diego State University Aztec Center on January 28, 1999 at 7:00 p.m. Approximately 11 people were in attendance.

   A summary of the scoping meetings, including the agenda, attendance lists, and comments made by attendees at the scoping meetings, and additional correspondence received during the scoping period are contained in Appendix A-1.

The comments received in response to the NOI and the NOP were used to assist in the determination of the scope of this EIR/EIS. As provided by NEPA and CEQA guidelines, the impact analysis documented in this EIR/EIS focuses on potential significant effects, which have been identified for the following elements of the human environment:

1. Geology/Soils/Mineral Resources
2. Water Resources
3. Biological Resources
4. Cultural Resources
5. Paleontological Resources
6. Transportation
7. Noise
8. Air Quality/Odors
9. Land Use
10. Recreational Resources
11. Visual Resources
12. Environmental Health and Public Safety

13. Socioeconomics
14. Public Services and Utilities

These issues are addressed in this EIR/EIS, including an evaluation of the affected environment, potential significant impacts, and mitigation measures that would be required for each area of significant environmental effect should the Proposed Action be implemented.

6.2 CONSULTATIONS

In addition to compliance with CEQA and NEPA, there are numerous environmental laws and regulations designed to protect environmental resources including threatened and endangered species, archaeological and historical sites, air quality, and water quality. These laws and applicable regulations must be satisfied before full implementation of the project.

Protection of air and water quality are reviewed by the respective responsible agencies through the CEQA and NEPA environmental review process and, especially, through each agency's permit application process. These permit review processes are typically completed following the CEQA and NEPA processes.

Protection of threatened and endangered species, and archaeological and historical sites, are also addressed as part of the CEQA and NEPA environmental review process, as well as by consultation with the agencies responsible for the protection of these resources. Compliance with these laws and regulations are being completed concurrently with the environmental review process for this project. The procedures being undertaken to comply with the laws and regulations for the protection of these resources are discussed on the following pages.

6.2.1 Threatened and Endangered Species

The federal Endangered Species Act (ESA) extends legal protection to plants and animals listed as endangered or threatened by the U.S. Fish and Wildlife Service (USFWS). The ESA authorizes the USFWS to review proposed actions to assess potential impacts to listed species. Consultation initiated between the BLM and USFWS with regard to endangered or threatened species is completed pursuant to Section 7 of the ESA. The "Section 7" consultation and review is based on a Biological Assessment, prepared by the BLM and submitted to the USFWS, that addresses the potential impact of the Proposed Action on any endangered or threatened species. The process results in a Biological Opinion issued by the USFWS to the BLM that indicates that the Proposed Action either "is" or "is not" likely to jeopardize the continued existence of the species. If the action is determined not likely to jeopardize the continued existence of the species, the Biological Opinion specifies measures, terms, and conditions that must be complied with for implementation of the project. BLM, as the public land administrator, is responsible for ensuring that the project complies with the specified stipulations.

The California Endangered Species Act (CESA) also offers legal protection to endangered or threatened plants and animals. Such plants and animals are listed in the state by the California Fish and Game Commission. Consultation with the California Department of Fish and Game (CDFG) for a permit pursuant to California Fish and Game Code Section 2081 is required prior to initiating any activities that could affect a designated endangered or threatened species. If the species under consideration is listed by both the ESA and the CESA, then California Fish and Game Code regulations enable the CDFG to concur with the USFWS Biological Opinion, to avoid duplicative procedures.

For the Mesquite Mine, the desert tortoise is the only threatened species at the project site. Other sensitive species, including the fairy duster, occur in the vicinity of the existing mine. BLM has entered into Section 7 consultation with the USFWS pursuant to the ESA with regard to these species and has prepared and submitted a Biological Assessment to USFWS. The Biological Opinion is to be issued by USFWS prior to consideration of project approval by the BLM. CDFG is also being consulted in compliance with the CESA. The existing conditions, potential impacts and proposed mitigating measures addressed in the Biological Assessment are summarized in this EIR/EIS.

6.2.2 Archaeological and Historical Sites

The National Historic Preservation Act of 1966 (NHPA), as amended, established: (1) a National Register of Historic Places (NRHP) to be maintained by the Secretary of the Interior, (2) the position of State Historic Preservation Officer (SHPO), and (3) the Advisory Council on Historic Preservation (ACHP). Section 106 of the NHPA requires federal agencies to provide the SHPO and ACHP an opportunity to comment on any project on federal lands within their state that would affect properties included in or eligible for inclusion in the NRHP. Section 304 directs federal agencies to withhold from disclosure to the public information relating to the location or character of eligible properties whenever disclosure of such information may create risk of harm to such resources.

NRHP eligibility criteria specify that the quality of significance in American history, architecture, archaeology, and culture is present in districts, sites, buildings, structures, and objects of national, state, or local importance that possess integrity of location, design, setting, materials, workmanship, feeling, association, and the following:

- Are associated with events that have made a significant contribution to the broad patterns of history; or
- Are associated with the lives of people significant in our past; or
- Embody the distinctive characteristics of type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

- Have yielded or are likely to yield information important in prehistory or history.

The Advisory Council regulations, "Protection of Historic and Cultural Properties" (36 CFR 800: Federal Register, Vol. 51, No. 169, September 2, 1986), outline procedures to be followed by federal agencies. Agencies are required to consult with the SHPO to determine if a proposed undertaking encompasses any property included in, or eligible for inclusion in, the NRHP. For each eligible property identified, the federal agency must determine if the proposed undertaking would have an effect. If there could be an effect, the Criteria of Adverse Effect are applied, and treatment measures are developed for resources that would be adversely affected. The regulations provide for consultation with the SHPO and ACHP to develop conditions for a Memorandum of Agreement for mitigation of potential adverse effects.

Within statutory constraints (NHPA Section 304 and Archaeological Resources Protection Act of 1979, Section 9), the Advisory Council regulations encourage participation by local governments, Native American tribes, and the public (36 CFR 800.1[c][2]). Within this context, comments on the proposed Mesquite Mine expansion from the Native American Heritage Commission, the local Native Americans, archaeologists, historians, and other groups or individuals concerned with cultural resources will be considered by BLM and Imperial County.

The proposed site has been inventoried for the presence/absence of historic or archaeological resources. This Cultural resource assessment and evaluation recommended that no sites were eligible for the NRHP.

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7 List of Preparers

This Environmental Impact Report/ Environmental Impact Statement (EIR/EIS) has been prepared jointly by the United States Department of the Interior, Bureau of Land Management (BLM) and the Imperial County Planning and Building Department (ICPBD). The following ICPBD and BLM Staff participated in the document preparation:

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8 REFERENCES

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9 Glossary of Terms and Acronyms

ACEC	Area of Critical Environmental Concern
ACHP	Advisory Council on Historic Properties (or Preservation)
acre-feet	The quantity of water that would cover one acre to a depth of one foot (43,560 cubic feet).
acf	Actual cubic feet
adit	A surface opening to an underground mine.
Algodones Dunes	The sand dune area about 8 miles southwest of the project site.
Aquifer	A body of rock or unconsolidated sediments that contains sufficient saturated permeable material to yield economic quantities of water to wells and springs.
Alluvial	Deposited by a stream or running water.
Alluvial fan	Funnel-shaped formations of sediment formed when intermittent torrential rains carry weathered material down from mountains and deposit it at the base of their slopes.
Alluvium	Material such as clay, silt, sand, or gravel deposited by streams.
Amos-Ogilby Basin	An elongated area (ground water basin) designated by the State of California Department of Water Resources.
AMSL	Above Mean Sea Level
Ancillary facilities	Support structures and equipment.

ANP	Acid neutralization potential
APCD	Air Pollution Control District
APE	Area of potential effect
AQAP	Air Quality Attainment Plans
AQMD	Air Quality Management District
ATC	Authority to Construct
Backfill	The process of refilling a mined-out pit with waste rock
Barren solution	Non-precious metals-bearing dilute cyanide solution
Bear Canyon Conglomerate	An Upper Miocene Sequence of variably cemented, interbedded nonmarine conglomerate beds and basaltic flows.
Berm	An elongate earthen structure which acts as a barrier: e.g., to make it difficult for a vehicle to cross, or to redirect the flow of water.
BLM	U.S. Bureau of Land Management
CAA	Clean Air Act
CAAA	Clean Air Act Amendments of 1990
CAAQS	Ambient Air Quality Standards
Cairns	Piles of rocks that, depending on their context, are interpreted to represent trail markers, trail shrines, boundary markers, or hunting blinds, mining claims, or burial markers.
Cal OSHA	California Occupational Health and Safety Act (or Administration)
Caltrans	California Department of Transportation
CAPCOA	California Air Pollution Control Officers Association
CARB	California Air Resources Board

CCR	California Code of Regulations
CDCA	California Desert Conservation Area
CDFG	California Department of Fish and Game
CDMG	California Department of Conservation, Division of Mines and Geology
CESA	California Endangered Species Act
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
cfs	Cubic feet per second
CMAGR	Chocolate Mountains Aerial Gunnery Range
cm/sec	Centimeters per second
CN^-	Free cyanide
CNPS	California Native Plant Society
CO	Carbon Monoxide - a by-product of incomplete combustion which bonds tightly to hemoglobin molecules in the bloodstream and thus reduces the oxygen carrying capacity.
COC	Chemical of Concern
Conglomerate	A rock composed of rounded fragments, varying from small pebbles to large boulders, in a cement of hardened clay, or the like.
CoSWMP	County Solid Waste Management Plan
CUP	Conditional Use Permit

Cyanide	A chemical compound comprised of calcium, potassium or sodium, carbon, and nitrogen. Cyanide is water soluble and is used in ore processing solutions to extract gold from crushed rock.
Desert pavement	An area consisting of stones that have been closely packed together to form a uniform, stony surface, generally without vegetation.
Desert varnish	This shiny black material containing approximately 70 percent clay, also contains oxides of iron and manganese which give it its black color. It is found primarily on the exposed side of desert pavement.
DTC	Desert Training Center
DWR	California Department of Water Resources
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
Endangered Species	A plant or animal species that has the possibility of becoming extinct by threats to its present and future reproductive capabilities.
EPA	U.S. Environmental Protection Agency
ESA	The federal Endangered Species Act of 1973
Evapotranspiration	Discharge of water from the earth's surface to the atmosphere by evaporation from lakes, streams, and soil surfaces, and by transpiration from plants.
FCR	Field contact representative
FLPMA	Federal Land Policy and Management Act
Foliation	A general term for a planar arrangement of textural or structural features in any type of rock; most commonly applied to metamorphic rock.
FY	Fiscal year

Geoglyphs	Designs on the ground that were formed by the artificial modification of desert pavements. They include areas where dark desert pavement has been scraped away to reveal the lighter subsoils, rock alignments, and configurations of cobbles and flaked stone. Also called earth figures, ground figures, or intaglios.
gpm	gallons per minute
H_2S	Hydrogen sulfide
HCN	Hydrogen cyanide
HDPE	High Density Polyethylene
Heap leach pad	A facility lined by impermeable material to collect the leach solutions which are slowly applied to a pile of ore placed in several layers on top
Holocene	An Epoch of the Quaternary period, from the end of the Pleistocene (approximately 10,000 to 11,000 years ago) to the present; synonym of Recent.
Hydraulic Conductivity	The capacity of a medium to transmit water; synonym of permeability. Expressed as the volume of water at the prevailing temperature that will move in unit time under a unit hydraulic gradient through a unit area. Units include gallons per day per square foot, centimeters per second.
ICAPCD	Imperial County Air Pollution Control District
IID	Imperial Irrigation District
Inversion	An increase in air temperature, instead of the usual decrease in air temperature, with an increase in height.
IOISA	In-pit Overburden/Interburden Storage Area
ISDRA	Imperial Sand Dunes Recreation Area
Isolates	Less than five artifacts in a 2.5 square meter area.

Leachate	A solution obtained by water percolating through soil containing soluble substances; in this case through the MSW residue being disposed of.
Leached ore	The ore that has been leached of its precious metals by the leaching solution on the heap leach pad
Lithic scatters	Surface scatters of flaked stone tools and manufacturing debris.
MCE	Maximum Credible Earthquake. The largest possible earthquake considering the known tectonic framework of an individual fault.
Mesozoic	A geologic era after the Paleozoic and before the Cenozoic, covering a period between 230 and 650 million years ago.
MSHA	Mine Safety and Health Administration
MPE	Maximum Probable Earthquake. The largest earthquake likely to occur with a 100-year return period at a given probability.
MSW	Municipal solid waste
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NDDB	California Department of Fish and Game Natural Diversity Database
Newmont	Newmont Gold Company
NHPA	National Historic Preservation Act of 1966
NO_2	Nitrogen dioxide
NOI	Notice of Intent
NOP	Notice of Preparation
NO_X	Nitrogen oxides - mainly nitric oxide (NO) and Nitrogen dioxide (NO_2) which participate with ROG in the ozone formation process, act as independent lung irritants, form eye irritants that

	cause watering, and may ultimately end up as airborne nitric acid droplets contributing to acid fog and acid rain.
NPDES	National Pollutant Discharge Elimination System Permit
NRHP	National Register of Historic Places
O_3	Ozone - a triatomic form of oxygen; toxic to micro organisms, but also a strong lung irritant which may lead to increased respiratory infection among senior citizens, young children, and any body in heavy work or exercise requiring frequent deep breathing into deep lung tissue. Ozone in the stratosphere is necessary because it absorbs strong radiation and protects people from skin cancer. Ozone in the near-surface atmospheric layer is harmful because of its irritating and oxidizing effects.
OHV	Off -highway vehicle
OHWM	Ordinary high water mark
Open pit	The area from which ore and waste rock are removed
OSHA	Occupational Health and Safety Administration
Patented land	A mining claim for which the United States government has conveyed the fee simple interest in the surface and minerals into private ownership
Pb	Lead
Perennial	A plant that has a life-cycle of more than two years.
Plan of Operation	A document prepared by the proponent of any mining development of locatable minerals and filed with the Bureau of Land Management, which presents a detailed discussion of the proposed project
Pleistocene	The first epoch of the Quaternary Period in the Cenozoic Era, characterized by the spreading and recession of continental ice sheets, and the appearance of modern man.
Pliocene	The last epoch of the Tertiary Period in the Cenozoic Era, during which many modern plants and animals developed.

PM_{10}	Respirable particulate matter (particles less than 10 microns in diameter).
PMP	Probable maximum precipitation
POO	Plan of Operation
Pregnant solution	A precious metals-bearing cyanide solution which contains sufficient quantities of gold and silver that can be sent to the precious metal recovery plant to remove the precious metals from the solution
Project area	The general vicinity around the project site
PSD	Prevention of Significant Deterioration
PVC	polyvinyl chloride
Quaternary	The second period of the Cenozoic era, covering the last two to three million years.
ROW	Right-of-way
RWQCB	Regional Water Quality Control Board
Salton Trough	A landward extension of the East Pacific Rise, a zone of rifting and crustal spreading which has caused the opening of the Gulf of California.
SCAQMD	South Coast Air Quality Management District
Scat	Excrement left by an animal, especially a wild animal.
Sensitive Species	Generic term for any plant or animal species which is recognized by the government or by any conservation group as being depleted, rare threatened, or endangered.
SHPO	State Historic Preservation Officer
Significant Environmental Impact	The Council on Environmental Quality regulations state that environmental impact statements ". . . shall provide full and fair discussions of significant environmental impacts," and that

impacts shall be discussed in proportion to their significance. In addition, the following definition of significance is provided in 40 CFR 1508.27:

"Significantly" as used in NEPA required considerations of both context and intensity:

Context. This means that the significance of an action must be analyzed in several contexts such as society as a whole (human, national), the affected region, the affected interests, and the locality. Significant varies with the setting of the proposed action. For instance, in the case of a site-specific action, significance would usually depend upon the effects in the locale rather than in the world as a whole. Both short- and long-term effects are relevant.

Intensity. This refers to the severity of impact. Responsible officials must bear in mind that more than one agency may make decisions about partial aspects of a major action. The following should be considered in evaluating intensity:

- Impacts that may be both beneficial and adverse. A significant effect may exist even if the Federal agency believes that on balance the effect will be beneficial.
- The degree to which the proposed action affects public health or safety.
- Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.
- The degree to which the effects on the quality of the human environment are likely to be highly controversial.
- The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks.
- The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration.

- Whether the action is related to other actions with individually insignificant but cumulatively significant impacts. Significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment. Significance cannot be avoided by terming an action temporary or by breaking it down into small component parts.

- The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources.

- The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determine to be critical under the Endangered Species Act of 1973.

- Whether the action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment.

A significant effect on the environment is defined by the State CEQA Guidelines (CEQA Guidelines, § 15382), as follows:

A substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic significance. An economic or social change by itself shall

not be considered a significant effect on the environment. A social or economic change related to a physical change may be considered in determining whether the physical change is significant.

Both the NEPA and CEQA definitions were considered in preparing this EIR/EIS.

SMARA	Surface Mining and Reclamation Act An act passed by the California legislature which prescribes the reclamation of mined lands within the state of California and directs the Counties within the state to review and approve a Reclamation Plan of each mining operation as part of the County's Conditional Use Permit process
SOCAB	South Coast Air Basin
SO_2	Sulphur dioxide
Solution pond	A bowl-shaped structure that is lined with an impermeable material and engineered to contain cyanide solution from the heap leach pad for processing in the precious metals recovery plant and subsequent recirculation to the heap leach pad
SO_x	Oxides of sulphur
SR	State Route
SRP	Newmont Safety Procedures
SWRCB	California State Water Resources Control Board.
Tertiary Age	The first period of the Cenozoic Era, covering the span of time between 65 and 2-3 million years ago.
Threatened Species	A species which, although not presently threatened with extinction, is likely to become endangered in the foreseeable future in the absence of special protection and management efforts.
TPD	Tons per day
U.S. DOI	U.S. Department of Interior
U.S. EPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	United States Geological Survey

Vadose zone	The saturated and/or unsaturated overburden soils above the permanent groundwater table.
Visual resource management	A classification of landscapes according to the kinds of structures and changes that are acceptable to meet established visual goals (Bureau of Land Management designation)
VRM	Visual Resource Management
Waste rock	Rock that contains either no gold or gold in quantities that cannot be economically extracted. Because such rock either lies on top of ore or is mixed in with the ore, waste rock must be mined in advance of or at the same time as the ore is mined.
Waste rock stockpile	Location within the mine and process area where excavated waste rock from the pits is stockpiled
Water table	The level in the saturated zone at which the pressure is equal to the atmospheric pressure.
WDR	Waste Discharge Requirements
WSA	Wilderness Study Area

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Appendices

to the

DRAFT
ENVIRONMENTAL IMPACT REPORT
ENVIRONMENTAL IMPACT STATEMENT

for the proposed

Mesquite Mine Expansion

August 2000

Appendices

to the

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Scoping Document

Scoping Meeting Summary

Prepared by BRG, Inc., January 26-28, 1999.

Proposed Mesquite Mine Expansion EIR/EIS

Public Scoping Meeting

United States Department of Interior
Bureau of Land Management
El Centro Resource Area
333 South Waterman Avenue
El Centro, CA 92243-2298

Yuma, Arizona
Best Western Inn Suites
Palm Canyon Room
January 26, 1999
7-10 p.m.

El Centro, California
El Centro Community Center
January 27, 1999
7-10 p.m.

San Diego State University
Best Western Inn Suites
Aztec Center, Backdoor Room
January 28, 1999
7-10 p.m.

Introduction

To comply with the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA), the Bureau of Land Management and the County of Imperial are preparing a joint Environmental Impact Report and Environmental Impact Statement (EIR/EIS) to evaluate the potential environmental impacts of the proposed Mesquite Mine Expansion.

Issues to be addressed in the EIR/EIS are being identified as a result of staff review, consultation with other agencies, and this public scoping meeting. The issues raised during this public scoping meeting will be incorporated into the analysis of potential environmental impacts in the EIR/EIS. A Draft EIR/EIS will be circulated to interested agencies and public for review and comment. A Final EIR/EIS will be prepared to respond to the comments received on the Draft EIR/EIS. The completed EIR/EIS will be utilized by local, state, and federal agencies in the permit review process.

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
California Desert District Office
6221 Box Springs Boulevard
Riverside, California 92507-0714

(CA-060.33)

JAN 11 1999

Dear Friend of the California Desert:

The Bureau of Land Management (BLM) has scheduled three scoping meetings to gather public comments and recommendations to provide guidance on the preparation of an environmental impact statement (EIS) for the proposed expansion of the Mesquite Mine, located in Imperial County. The meetings will be held at the following locations:

Tuesday, January 26, 7-10 p.m
Best Western Inn Suites
Palm Canyon Room
1450 Castle Dome Avenue
Yuma, AZ (520) 783-8341

Wednesday, January 27, 7-10 p.m.
El Centro Community Center
375 South First Street
El Centro, CA (760) 337-4555

Thursday, January 28, 7-10 p.m.
San Diego State University
Aztec Center, Backdoor Room
5500 Campanile Drive
San Diego, CA (619) 594-5278

Newmont Gold Company, operator of the Mesquite Gold Mine, has proposed to expand mining operations through a plan modification. BLM's El Centro Field Office will oversee the preparation of the EIS by a third party contractor on the impacts of the proposed expansion.

The Mesquite Mine will deplete current ore reserves by the end of year 2000. The proposed expansion would extend mining operations for seven years into 2006. Approximately 60 million tons of ore and 180 million tons of waste rock would be processed from two existing pits. If approved, the expansion would encompass approximately 300 acres of federal, state, and private (patented) land, of which 150 acres would be new disturbance.

Public comments regarding the preparation of the draft EIS for the proposed expansion of the Mesquite Mine will be accepted through Monday, March 1, 1999. Written comments should be submitted to the Field Manager, Bureau of Land Management, El Centro Field Office, 1661 South 4th Street, El Centro, CA 92243, Attn: Geologist.

For more information contact Kevin Marty in BLM's El Centro office at (760) 337-4400.

Sincerely,

Tim Salt
Acting District Manager

RECEIVED
JAN 14 1999
IMPERIAL COUNTY
PLANNING, BUILDI

Notice of Public Meetings
Mesquite Gold Mine Proposed Expansion

The Bureau of Land Management (BLM) has scheduled three public scoping meetings to gather public comments and recommendations regarding the preparation of an environmental impact statement on the proposed expansion of the Mesquite Gold Mine, located in Imperial County. The meetings will be held at the following locations:

January 26, 7-10 pm, Best Western Yuma Inn Suites, Palm Canyon Room, 1450 Castle Dome Ave., Yuma, Az. (520) 783-8341

January 27, 7-10 pm, El Centro Community Center, 375 South First Street El Centro, CA (760) 337-4555

January 28, 7-10 pm, San Diego State University, Aztec Center-Backdoor Rm 5500 Campanile Drive, San Diego, CA (619) 594-5278.

The proposed expansion would extend mining operations for seven years. The expansion would encompass 300 acres of federal, state, and private (patented) land, of which 150 acres would be new disturbance. For more information contact BLM at (760) 337-4400.

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Public Meeting Agenda

Yuma, Arizona
Best Western Inn Suites
Palm Canyon Room

Public Scoping Meeting

January 28, 1999
7-10 p.m.

Yuma, Arizona

Best Western Inn Suites
Palm Canyon Room

Public Scoping Meeting

January 26, 1999
7-10 p.m.

Yuma Scoping Meeting
Key Points Made by Speakers

1. A description of the area/environment with photos are needed.
2. Discussion of why an EIS vs. an EA is being done.
3. Where and how much more leachate/runoff will be generated from this proposal.
4. Discuss the increased scale of operations and the environmental impacts for air water, etc.
5. What is the approximate time table for the NEPA/CEQA process and history.
6. Discuss history of previous permits/environmental documents for Mesquite Mine.
7. How will cultural resources be protected in the expanded areas and are there spiritual sanctuaries for Native/Americans on-site?

Scoping Meeting Sign-In Sheet
Mesquite Mine Expansion EIR/EIS Project
Yuma, AZ — January 26, 1999

Please Print Legibly

Name	Organization	Mailing Address
RICHARD CABANILLA	I.C. PLANNING/BLDG DEPT	939 MAIN ST. EL CENTRO, CA 92243
Elayn Briggs	BLM	1661 S4th St El Centro CA 92243
BRUCE KRATING	NEWMONT	6502 E. HWY 78 BRAWLEY, CA 92227
KEVIN LANG	NEWMONT	2651 S. 8th AVE #3084 Yuma, AZ 85364
RAMON LAMACHI	NEWMONT	8344 YAVAPAI LN YUMA AZ.
Bob Mitts	NEWMONT	6502 E Hwy 78 Brawley CA 92227
George Conger	Newmont	1700 Lincoln St. Denver, CO 80401
LOREY CACHORA	Quechan Cultural Comm Ft Yuma Indian Res	P.O. Box 894 Winterhaven, Ca 92283
LINDA CACHORA	" "	" "
Pauline Pascal	Quechan Cultural Committee	P.O. Box 1899 Yuma, Az 85366
Pauline Pascal	Quechan Cultural Committee	P.O. Box 282 - Winterhaven, CA. 92283
Dan Purvance	citizen	3634 W. 13th Pl Yuma, AZ
Tom Negleman	citizen	2157 E 26th Way Yuma Az
Jim Craig	Citizen	N/A
Ruby Craig	"	"

Scoping Meeting Sign-In Sheet
Mesquite Mine Expansion EIR/EIS Project
Yuma, AZ — January 26, 1999

Please Print Legibly

Name	Organization	Mailing Address
Richard L. Carrico	Mooney Environmental	9903 Businesspark Avenue S.D. CA 92103
William Eckhardt	Mooney	9903 Businesspark Ave, San Diego, CA. 92103
DALE A. LOUCKS	NEWMONT	6502 E Hwy 78 BRAWLEY, CA 92227
CRAIG A. SMITH	MESQUITE MINE	6502 E Hwy 78 BRAWLEY CA 92227
~~JEFF~~ HUSPENI	NEWMONT	5664 SO. FULTON WAY, DENVER CO 80111
DON HARRIS	Newmont Gold Co.	7311 E 24th Place, Yuma, AZ 85365
GARY SUMMERS	NEWMONT	11227 CARDINAL LN. YUMA AZ. 85365
Gary Boyle	citizen	PO BOX 758 Winterhaven, CA. 92283
Dennis LAYBOURN	~~Ameri~~ Citizen	P.O. Box 879 Winterhaven, CA 92283
Preston & Arrowweed	Quechan Tribe	P.O. BOX 160 Bard, Ca. 92222
CY & ALTA DIXON	GOLD ROCK RANCH	2401 GOLD ROCK RD – WINTERHAVEN
DAVID WHITE	NEWMONT GOLD CO.	1700 LINCOLN ST DENVER, CO 80203
Lisa Wade	Newmont Gold	6502 E Hwy 78 Brawley, CA 92227
Kevin Marty	BLM	1661 South 4TH St. El Centro, CA 92243

El Centro, California

El Centro Community Center

Public Scoping Meeting

January 27, 1999

7-10 p.m.

El Centro Scoping Meeting
Key Points Made by Speakers

1. A description of the visual impacts of project from Highway 78.
2. Discussion of socio-economics, i.e. pay scale/quality of employment of jobs generated.
3. If expansion not approved, how it would affect the "unemployment rate" in I.C.
4. How will changing the storm water diversion affect other water ways (ephemeral washes)?
5. Water for expansion, where from, affects on groundwater/"flora & fauna."
6. What is final use of pits (post-mining).
7. Any future plans for expansion (following this expansion)?
8. Explain existing acreage disturbance vs. new disturbance acreage.
9. Explain additional power usage, power line expansions, new structures, etc.

D

Scoping Meeting Sign-In Sheet
Mesquite Mine Expansion EIR/EIS Project
El Centro, CA — January 27, 1999

Please Print Legibly

Name	Organization	Mailing Address
RICHARD CABANILLA	I.C. PLANNING/BLDG DEPT	939 MAIN ST., EL CENTRO, CA 92243
Tim Boardman	——	2530 Hamilton Ave El Centro CA 92243
Kevin Marty	BLM	1661 South 4TH St, El Centro, CA 92243
GREG PELKA	CALIFORNIA STATE LANDS COMMISSION	200 OCEANGATE, 12TH FLOOR, LONG BEACH, CA 90802
MARC SPRINGER	BLM	P.O Box 356 Coyote Valley, Ca 95631
Elayn Briggs	BLM	1661 S 4th St El Centro CA 92243
GEORGE E. COLLINS	IID	333 E. BARIONI BLVD., Imperial 92251
Karen Collins	SER	PO Box 430 Ocotillo CA 92259
Gary Boyle	citizen	PO Box 758 Winterhaven CA 92283
William C DUFFY	CITIZEN	PoBox 9201 CEDAR PINES PARK CA. 92322
Martha V. Iniguez	Spouse/Newmont Gold Employee	301 Tangerine Drive ElCentro, CA 92243
Gregorio Iniguez	Newmont Gold Employee	301 Tangerine Drive ElCentro, CA 92243
Steven M Taylor	Newmont gold Employee	P.O Box 786 Winterhaven CA 92283
LeRoy Lopez	NEWMONT	1911-A ORCHARD RD Holtville, CA 92250
Bob Ham	COLAB of Imperial County	1000 Broadway El centro 92243

2.

Scoping Meeting Sign-In Sheet
Mesquite Mine Expansion EIR/EIS Project
El Centro, CA — January 27, 1999

Please Print Legibly

Name	Organization	Mailing Address
John Ochs	PRIVATE CITIZEN	1202 OLIVE AVE, EL CENTRO 92243
Billie Padilla	Newmont - Arid	599 W. Murphy Rd Imperial 92251
Chris Padilla	Newmont - Mesquite	599 W. Murphy Rd, Imperial 9225
BOB FILLER	ARID OPERATIONS	444 So. 8TH ST, STE B1, EL CENTRO. 92243
Brian Carlson	STATE	3801 AUTOMATION FORT C CO 808
Bill Ott	Imperial County	940 Main El Centro
John Mudge	Newmont Gold	427 Ridge St Suite C Reno NV 89501
Lisa Wade	NGC	1531 W Ross # B-107 El Centro
Esteban Magana		
JOE HERNANDEZ	IC DPW.	155 11th ST EL CENTRO
JIM STRAIN	CFMS	1920 UNDERWOOD RD HOLTVILLE

San Diego State University (SDSU)

Aztec Center, Backdoor Room

Public Scoping Meeting

January 28, 1999

7-10 p.m.

SDSU Scoping Meeting
Key Points Made by Speakers

1. What environmental problems with the increase in storm drainage create below the property?
2. How has the existing "petroglyph" been treated and what will the impacts be due to the proposed expansion.
3. If cultural resources are found (not previously known existed) how will they be mitigated (treated) and who will be notified (question by Courtney Coyle, Attorney)?
4. A complete rundown on the "No Action" alternative to be in EIR/EIS (Harriet Allen).

(1)

Scoping Meeting Sign-In Sheet
Mesquite Mine Expansion EIR/EIS Project
San Diego State University (SDSU) — January 28, 1999

Please Print Legibly

Name	Organization	Mailing Address
ROY FEATHERS	Western Mining Council	221 W. Park Ave, El Cajon Cal 92020 619-447-7525
Erich Lathers	BRG Consulting	1550 N. Hotel Circle Dr., Suite 320 SD 92108
RICHARD CABANILLA	I.C. PLANNING/BDG DEPT.	939 MAIN ST. EC CENTRO, CA 92243
Kevin Marty	BLM	1661 South 4TH St, El Centro, CA 92243
Craig SMITH	NEWMONT	6402 E Hwy 78, BRAWLEY, CA 92227
Elayn Briggs	BLM	1661 S 4th St El Centro CA 92243
Mike Wdawender	SDSU	Dept Geol. Sci SDSU San Diego 92182
Courtney Coyle	Attorney	1609 Soledad Avenue La Jolla CA 92037
Randy Rodriguez	BRG Consulting	1550 HOTEL CIRCLE DRIVE NORTH #320, SD 92108
RICHARD CARRICO	Mooney Environmental	9903 Businesspark Ave S.D. CA 92103
Harriet Allen	Desert Protective Council	3750 El Canto Spring Valley CA 1977

(2)

Scoping Meeting Sign-In Sheet
Mesquite Mine Expansion EIR/EIS Project
San Diego State University (SDSU) — January 28, 1999

Please Print Legibly

Name	Organization	Mailing Address
DAVE PAQUIN	WESTERMINING Corp.	9255 MAGNOLIA SANTEE CA 92071
JIM SEAY	WESTERN MINING CORP.	3290 SAN CARLOS DR. SPRING VALLEY, CA

· Appendix A-2 ·

Notice of Preparation/Notice of Intent and Reponses

Prepared by BRG, Inc., December 1998.

Notice of Intent and Responses

December 28, 1998

[Federal Register: December 28, 1998 (Volume 63, Number 248)]
[Notices]
[Page 71499]
From the Federal Register Online via GPO Access [wais.access.gpo.gov]
[DOCID:fr28de98-84]

DEPARTMENT OF THE INTERIOR

Bureau of Land Management
[CA-067-1990; CA-40204]

Notice of Intent To Prepare an Environmental Impact Statement (EIS) on the Proposed Expansion of an Existing Gold Mining/Processing Operation

AGENCY: Bureau of Land Management.

ACTION: Notice of intent.

SUMMARY: Newmont Gold Company (NGC), operator of the Mesquite gold mine located in Imperial County, California, has proposed to expand mining operations by a plan modification submitted to the Bureau of Land Management (BLM), El Centro field office, on November 30, 1998. Pursuant to Section 102(2)(c) of the National Environmental Policy Act of 1969, the BLM will direct the preparation of an environmental impact statement (EIS) by a third party contractor on the impacts of an expansion of this gold mining/processing operation. Comments are being requested to help identify significant issues or concerns related to the proposed action, to determine the scope of the issues (including alternatives) that need to be analyzed, and to eliminate from detailed study those issues that are not significant. Supporting documentation should be included with comments recommending that the EIS address specific environmental issues. Public scoping meetings will be held (see below).

DATES: For scoping meetings and comments: Three public scoping meetings will be held during 1999 on the following dates and locations: January 26, from 7-10 pm, at the Best Western Yuma Inn Suites, Palm Canyon Room, 1450 Castle Dome Ave., Yuma, Az. ph (520) 783-8341; January 27, from 7-10 pm, at the El Centro Community Center, 375 South First Street, El Centro, Ca. ph (760) 337-4555; and January 28, from 7-10 pm, at San Diego State University, Aztec Center-Backdoor Room, 5500 Campanile Drive, San Diego, Ca. ph (619) 594-5278. Written comments must be postmarked no later than Monday, February 8, 1999.

ADDRESSES: Written comments should be addressed to the Field Manager, Bureau of Land Management, El Centro Field Office, 1661 South 4th Street, El Centro, California 92243, ATTN: Geologist.

FOR FURTHER INFORMATION CONTACT: Kevin Marty, Bureau of Land Management, El Centro Field Office, 1661 South 4th Street, El Centro, California 92243, (760) 337-4400.

SUPPLEMENTARY INFORMATION: This Mesquite Mine began operations under an approved plan of operations during 1985. Since this time, several expansions and plan modifications have occurred, which are summarized within the approved Mesquite Mine consolidated plan of operations dated October, 1995. According to the Code of Federal Regulations found at Title 43 CFR 3809.1-7, a significant modification of an approved plan must be reviewed and approved by the authorized officer (i.e., BLM) in the same manner as the initial plan. Pursuant to Title 43 CFR 3809.1-7, Newmont has submitted a plan of operations for their proposed mine expansion for approval by the Bureau of Land Management.

This plan modificat' is now under review by the BL' and other Federal, State and local agencies. The public may review his document at the BLM, El Centro Field Office, 1661 South 4th Street, El Centro, CA 92243, or at the Imperial County Planning Department, 939 Main Street, Suite B-1, El Centro, CA 92243.

The expansion would allow the company to continue extracting and processing economical gold deposits, delineated by drilling programs' initiated during 1988 and continuing to date. Current ore reserves would be depleted by the end of year 2000, while expansion would increase the mine life a projected seven years into year 2006. The plan modification proposes to process approximately 60 million tons of ore and 180 million tons of waste rock by the expansion of two existing pits: the Big Chief and Rainbow open pits. The pit expansions would encompass approximately 300 acres of Federal, State and private (patented) land, of which 150 acres would be new land disturbance. The plan amendment also describes expansion of an existing heap leach facility on approximately 70 acres of private land to accommodate the new leach material; alternative methods for storage of waste rock, either in existing mined-out open pits, at new or expanded out-of-pit storage areas, or a combination of both; and construction of ancillary facilities including roads, fencing and drainage diversions.

Dated: December 18, 1998.
Thomas Zale,
Acting Field Manager.
[FR Doc. 98-34248 Filed 12-24-98; 8:45 am]
BILLING CODE 4310-40-P

Parsons
Behle &
Latimer

A PROFESSIONAL
LAW CORPORATION

201 South Main Street
Suite 1800
Salt Lake City, Utah
84111-2218
Post Office Box 45898
Salt Lake City, Utah
84145-0898
Telephone 801 532-1234
Facsimile 801 536-6111
E-Mail: pbl@pblutah.com

NOT

January 5, 1999

Kevin Marty
Bureau of Land Management
El Centro Field Office
1661 South 4th St.
El Centro, CA 92243

Re: Request for Placement on Mailing List

Dear Mr. Terry:

This letter is to request that David L. Deisley be place on your mailing list concerning the project referred to on the attached Federal Register notice. Please use the following address:

David L. Deisley
PARSONS BEHLE & LATIMER
P.O. Box 45898
Salt Lake City, UT 84145-0898

Thank you for your attention to this matter. If you have any questions, please feel free to call.

Very truly yours,

PARSONS BEHLE & LATIMER

Julie Mounteer
Secretary to David L. Deisley

jpm

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

RECEIVED
99 FEB 11 PM 1:55
EPA REGION IX
SAN FRANCISCO, CA

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70 comment total

February 4, 1999

Thomas Zale, Acting Field Manager
Bureau of Land Management
El Centro Field Office
1661 South 4th Street
El Centro, California 92243

Dear Mr. Zale:

The U.S. Environmental Protection Agency (EPA) has reviewed the Notice of Intent (NOI) to prepare an Environmental Impact Statement (EIS) for a proposed **Expansion of an Existing Gold Mining/Processing Operation– Mesquite Gold Mine, Imperial County, California**. Our comments are provided pursuant to the National Environmental Policy Act (NEPA), the Council on Environmental Quality's NEPA Implementation Regulations at 40 CFR 1500-1508, and Section 309 of the Clean Air Act.

The Mesquite Mine has been in operation since 1985. The current proposed expansion would allow Newmont Gold Company (NGC), to continue extracting and processing economical gold deposits, developed through ongoing exploration. BLM must decide whether to approve the modifications to an existing consolidated plan of operations. Approval of the modifications would allow NGC to process approximately 60 million tons of ore and 180 million tons of waste rock by expanding two existing pits. An existing heap leach facility would also be expanded by about 70 acres.

The scope of subjects that should be included in the EIS is described in the comments attached. Topics include, water resources, biologic resources, air quality, mining waste and site reclamation/remediation, and discussion of applicable regulations/permits. In its scoping process and as a matter of Federal policy, BLM should strive to identify other environmental review and consultation requirements so the lead, and any cooperating agencies, may prepare other required analyses and studies concurrently with, and integrated with, the EIS (40 CFR 1500.2(c) and 40 CFR 1501.7(a)(6)). The EIS should include a thorough section on direct, indirect and cumulative impacts (see 40 CFR 1508.7 -- "past, present, and reasonably foreseeable impacts") taking into full consideration impacts from the existing operation, the planned expansion, and any other nearby activities. The EIS should strive for accurate scientific analysis [40 CFR 1500.1(b)] in the collection/compilation of baseline data, in order to understand the environmental consequences of the ongoing mining operation, and the proposed expansion. EPA encourages BLM to summarize previous NEPA documentation and reference all previous studies. We expect that due to the long history of the project BLM has ample data to document existing mining-related impacts, and should do so, in the EIS.

Please send two copies of the Draft EIS to this office at the letterhead address (Attention David Farrel, CMD-2) when it is officially filed with our Washington, D.C., office. If you have questions, please call me at (415) 744-1483, or Jeanne Geselbracht at (415) 744-1576.

Sincerely,

Karl Kanbergs, Geologist
Office of Federal Activities

Enclosure
MI: 003210
cc: Mark Durham, U.S. Army Corps of Engineers, Los Angeles

General Comments and NEPA

Information regarding the potential adverse environmental impacts of hard rock mining and ore processing operations, and techniques for mitigating these effects have been collected over the last several years. Although EPA acknowledges that, for the most-part, today's mine operators strive for compliance with environmental laws and integrate environmental planning into their operations, the sheer magnitude and complexity of many operations pose difficult environmental problems and questions. In particular, much uncertainty remains regarding the long-term effects of mine waste and mine water disposal, groundwater withdrawals, and related indirect and cumulative impacts to biologic resources and human health and activities. The EIS/EIR (hereafter called the EIS) offers an opportunity to document baseline conditions, predict future potential impacts, and to conduct a thorough analysis of environmental impacts of the selected alternatives to the proposed action. In the EIS, BLM should provide mitigation measures and a foundation for allowing current and future planning and permitting decisions. The EIS should strive for "accurate scientific analysis and expert agency comments" [40 CFR 1500.1(b)] and emphasize "full and fair discussion of significant environmental impacts..." [40 CFR 1502.1].

1. EPA recommends that the EIS provide a thorough baseline report regarding water resource status (chemical and physical), and known impacts to biologic resources, related to current and/or past project activities. The EIS should also strive to determine to what extent natural background conditions (non-mining related) influence the above-mentioned resources and impacts.

2. The EIS should demonstrate that all reasonable alternatives to proposed actions have been examined and that appropriate mitigation measures have been thoroughly considered and incorporated into the project. The EIS should provide substantial detail on the means of implementing mitigation measures, and should also identify how monitoring would proceed to ensure compliance and assess effectiveness of mitigation.

6. BLM should provide, preferably in table form, information on all applicable permits and responsible agencies. The EIS should also contain a list of all used and generated hazardous materials. We recommend including a mitigation and monitoring table, organized by resource category.

Alternatives

9. The EIS should rigorously explore and objectively evaluate all reasonable alternatives, including reasonable alternatives not within the jurisdiction of your agency, pursuant to 40 CFR 1502.14. Reasonable alternatives could include, but are not necessarily limited to, alternative sites or alternative designs for major mining facilities (e.g., pits, waste rock piles, tailings impoundments,

processing facilities, etc.), a smaller project, different waste treatment designs; as well as any alternatives evaluated for purposes of obtaining a Clean Water Act (CWA) Section 404 permit, pursuant to 40 CFR Part 230.

Water Resources

The project is located within an extremely arid environment. As such, groundwater and surface water resources are particularly valuable and important. The EIS should address potential water quality and resource issues, and related biologic resources, under description of affected environment [40 CFR 1502.15], direct and indirect effects [40 CFR 1508.8(a)(b)], environmental consequences [40 CFR 1502.15] and cumulative impacts [40 CFR 1508.7]. In this process, the EIS should include baseline data from past/current water quality monitoring, and any information on water table draw-downs. Any observable trends should be discussed. Specific water resource issues are listed below.

1. The EIS should describe the potential impacts on groundwater and surface water, estimating rates of water produced and/or consumed by the proposed project as well as all other related projects. It should identify direct, indirect, and cumulative impacts to surface and groundwater flow, water supply wells, springs and seeps, vegetation, wildlife, and other groundwater-dependent resources as a result of groundwater pumping and any mine water/process water discharge associated with the proposed project. Any expected adverse impacts to down-wash riparian corridors from emplacement of diversion channels should be thoroughly discussed. If adverse impacts are expected, the EIS should provide a mitigation and monitoring plan. In particular, the EIS should address the potential cumulative effects.

2. For each alternative, the EIS should discuss the project's compliance with state-adopted, EPA-approved water quality standards. The project planning should be fully coordinated with all of the appropriate Federal and State offices (e.g, U.S. Army Corps of Engineers and California Regional Water Quality Control Board) to ensure that water quality is protected and beneficial uses are maintained.

3. The EIS should discuss whether a National Pollution Discharge Elimination System (NPDES) permit would be required or exists for discharges to surface waters.

4. The EIS should note that, under the Clean Water Act, any project disturbing a land area greater than five acres requires a storm water discharge permit. BLM should document the project's consistency with applicable storm water permitting requirements. Furthermore, a storm water pollution prevention plan should be included. The EIS should discuss specific mitigation measures that may be necessary.

5. The EIS should completely describe the original (natural) drainage patterns in the project locale, as well as the drainage patterns of the area during project operations and following reclamation. It should include hydrologic and topographic maps of the areas. This discussion should encompass effects of the project on erosion potential and sedimentation. Furthermore, the EIS should identify whether any components of the proposed project would fall within 50 or 100 year flood plains and discuss the potential for flash floods to transport sediment from disturbed areas to stream channels.

6. The EIS should include a discussion on how accidental releases of hazardous materials, including pipe rupture or overflow from ponds, would be handled and is being handled. It should identify the potential impacts resulting from failure of components of the solution containment systems and leaching facilities, methods for discovering such failures, and the degree to which impacts would be reversible.

7. The acid generation/neutralization potential (AGNP) and potential for meteoric water to leach toxic constituents from wallrock, waste rock, stockpiles, tailings, and backfill at the site, and appropriate mitigation measures should be included in the EIS. If sulfide ore or waste is recognized or anticipated to be excavated in the future, this should be fully discussed. A description of applicable leach tests (e.g. meteoric mobility) to be conducted on ore and waste rock and test data, including sample locations, is also requested. BLM should also describe the quality of waters at any other mining sites nearby, under cumulative impacts. The EIS should include a Waste Rock Characterization and Disposal Plan (or an appropriate summary).

8. The EIS should describe in detail the proposed facility design and operation, and maintenance and monitoring activities, to ensure integrity of facilities throughout project operations and closure. Locations of all points of compliance and monitoring wells on the site, including screening intervals, parameters to be monitored, and monitoring frequencies should be noted.

9. The EIS should discuss if any of the open pits would extend below the existing water table, and if so, whether a future pit lake would be likely to develop. If any pit lakes are likely to develop, EPA encourages a reclamation option to backfill above the water table. If this is economically unfeasible (and should be demonstrated), then expected pit lake chemistry and potential adverse impacts to beneficial uses, including biologic resources, should be thoroughly analyzed in the EIS.

10. BLM should consult with the U.S. Army Corps of Engineers to determine if any component of the proposed project requires a Section 404 permit under the CWA. Section 404 of the CWA regulates the discharge of dredge or fill material into waters of the United States.

EPA strongly recommends avoidance of waters of the United States, and encourages BLM to

fully explore alternatives that avoid siting of project facilities in waters of the United States. However, if a permit is required, EPA will review the project for compliance with Federal Guidelines for Specification of Disposal Sites for Dredged or Fill Materials (40 CFR 230), promulgated pursuant to Section 404(b)(1) of the Clean Water Act. Pursuant to 40 CFR 230, any permitted discharge into waters of the U.S. must be the least environmentally damaging practicable alternative available to achieve the project purpose. If, under the proposed project, dredged or fill material would be discharged into waters of the U.S., the EIS should discuss alternatives to avoid those discharges. This discussion of alternatives should be rigorously done to show compliance with the CWA 404 Guidelines.

If a discharge cannot be avoided, the EIS should discuss how remaining impacts would be minimized and mitigated. This discussion should include (a) assessment of the area impacted by type, function and habitat, (b) acreage and habitat type and function of waters of the U.S. that would be created or restored; (b) water sources to maintain the mitigation area; (c) the revegetation plans including the numbers and age of each species to be planted; (d) maintenance and monitoring plans, including performance standards to determine mitigation success; (e) the size and location of mitigation zones; (f) the parties that would be ultimately responsible for the plan's success; and (g) contingency plans and financial assurance that would be enacted if the original plan fails. Mitigation should be implemented in advance of the impacts to avoid habitat losses due to the lag time between the occurrence of the impact and successful mitigation.

Vegetation and Wildlife

The BLM should work closely with the U.S. Fish and Wildlife Service (FWS) and the California Department of Fish and Game in order to determine existing and future potential impacts of the project on plant and wildlife species, especially species classified rare, threatened, or endangered on either state or federal lists. We also request that you provide information on potential impacts to candidate species. We encourage BLM to complete the consultation process with FWS prior to completion of the Final EIS. Particular attention should be paid to potential adverse impacts to birds from use of cyanide-bearing solutions. Any history or case studies documenting previous adverse effects to birds should be noted, and appropriate mitigation measures discussed.

In addition to jurisdictional waters of the U.S., the EIS should identify riparian habitat as well as other unique or important habitat areas that could be affected by the project. If applicable, the EIS should discuss avoidance, minimization, and mitigation of losses or modification of habitat and plant and animal species composition, and include a detailed mitigation plan.

Cumulative Impacts

The EIS should address potential cumulative impacts to resources, considering the proposed project in the context of past, current, and reasonably foreseeable future mining and other activities in the project vicinity. The analysis should include a discussion of impacts to water and air quality, hydrology, soils, vegetation, wildlife, biodiversity and human health. The CEQ report, *Considering Cumulative Effects Under the National Environmental Policy Act*, contains useful information on ways which BLM could use to craft an effective cumulative impacts section. The complete document may be down loaded from the following URL address: http://ceq.eh.doe.gov/nepa/ccenepa/ccenepa.htm. According to the CEQ, the principles of cumulative impacts analysis are: inclusion of past, present and future actions, inclusion of federal, nonfederal, and private actions, focus on each affected resource, ecosystem, and human community, and focus on truly meaningful effects. Determination of the affected environment should not be based on a predetermined geographic area, but rather on perception of meaningful impacts and natural boundaries.

Air Quality

1. The EIS should discuss if the project area is in an attainment area for priority air pollutants. The EIS should discuss the National Ambient Air Quality Standards (NAAQS) and Prevention of Significant Deterioration (PSD) increments applicable to air quality in the project area. PSD increments exist for sulfur dioxide, total suspended particulates, and oxides of nitrogen. BLM should discuss impacts to the NAAQS and PSD increments from estimated emissions, considering the cumulative effects from all aspects of mine excavation, construction, operation, and support activities, such as vehicle traffic. BLM should closely coordinate with the appropriate California air pollution control district regarding regulatory requirements and controls. The EIS should also discuss whether a PSD permit will be required for the project and discuss any mitigation measures necessary to comply with NAAQS and PSD.

2. PSD increments are highly protective of air quality in Class I areas such as wildernesses and national parks. The EIS should identify any Class I PSD areas located within at least 100 kilometers of the proposed project site. Class I areas even further away could potentially be affected as well. The BLM should consult with the U.S. Forest Service and the National Park Service for a determination of which areas could be adversely affected by the proposed action. Potential impacts to Class I PSD areas, including visibility impacts, should be discussed.

3. Since the Clean Air Act prohibits federal approval of a project for which conformity with the State Implementation Plan (SIP) cannot be assured, the EIS should explain

how the proposed project is in conformity with the California SIP.

4. The EIS should discuss the possibility of an air quality monitoring program which would be implemented to ensure project compliance with all applicable air quality standards and permits.

Mining Waste Management and Land Reclamation

1. The EIS should minimally discuss the following components of reclamation : (a) a detailed account of measures taken to decommission mine operations, and neutralize or cap waste rock, tailings, and other process facilities; (b) identification (including estimated acreage) of the areas targeted for reclamation, and clarification of the intended degree of treatment in each area; (c) estimation of any irrigation requirements; (d) timing of reclamation relative to mining operations and duration of reclamation treatment; (e) standards for determining and means of assuring successful reclamation; and (f) means of assuring that any maintenance required for reclaimed areas would continue after operations cease or while operations are suspended.

2. We recommend that BLM require that revegetation be accomplished with only native species indigenous to the area in order to restore the ecosystem to as natural a state as possible after mine closure. We also recommend that revegetation success be monitored and enforced for at least five years following revegetation efforts. First or second year success in meeting the revegetation standards is not necessarily indicative of long-term success.

3. We recommend that the EIS discuss provisions that would be made for post-operation surveillance to ensure that neutralization and/or stabilization of mining waste sites has been effective. BLM should describe the mitigation actions that would be taken should de-stabilization or contamination be detected, and identify who would be responsible for these actions.

4. The EIS should specify the bonding requirements to ensure that appropriate funding is available for reclamation should the mining company fail to carry out all required reclamation activities and identify who would be responsible for any post-closure cleanup actions should they be necessary. EPA also recommends that BLM review bonding requirements for early mine closure contingency and handling of pit lakes.

Environmental Justice/Tribes and Archeological/Cultural Resources

In keeping with Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations" (EO 12898), the EIS should

describe the measures taken by the BLM to: 1) fully analyze the environmental effects of the proposed federal action on minority communities and low-income populations, and 2) present opportunities for affected communities to provide input into the NEPA process. The EIS should state whether the analysis meets requirements of your agency's environmental justice strategy. 73
The EIS should also indicate the efforts made by the BLM to enter into government to government consultations with potentially affected Tribes, particularly in regard to sacred sites and traditional cultural properties. The results of those consultations should also be presented in the EIS. BLM should also discuss their Federal trust responsibilities. A thorough archeological and paleontological survey should be conducted. 74 75 76

Land Use

The EIS should refer to appropriate BLM natural resource and land use plans and in particular identify any special uses that would be displaced by the proposed project, and discuss the proposed project's specific potential impacts to these uses. 77

Toxic Releases Inventory

BLM and Newmont should note that on May 1, 1997, EPA added metal mining to the list of industries that will be subject to the reporting requirements of section 313 of the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA) and section 6607 of the Pollution Prevention Act of 1990. (See 40 CFR Part 372, Addition of Facilities in Certain Industry Sectors; Revised Interpretation of Otherwise Use; Toxic Release Inventory Reporting; Community Right-to-Know; Final Rule, Federal Register: May 1, 1997, pages 23833-23892). Reporting for mining facilities will be effective beginning with the 1998 reporting year. The first reports from all metal mining facilities must be submitted to EPA and the State by July 1, 1999. For specific information regarding the final rule, you may wish to call Mr. Tim Crawford, EPA Headquarters, at (202)260-1715; e-mail: crawford.tim@epamail.epa.gov.

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El Centro Chamber of Commerce & VISITORS BUREAU

1095 South 4th Street
Post Office Box 3006
El Centro, CA 92244 - 3006
(760) 352-3681
(760) 352-3246
http: //www.elcentrochamber.com
E-mail: generalinfo@elcentrochamber.com

February 8, 1999

Tom Zale, Acting Field Manager
Bureau of Land Management
El Centro Field Office
1661 S. 4th Street
El Centro, CA 92243

RE: EIS for the proposed expansion of Mesquite Mine

Dear Mr. Zale:

The El Centro Chamber of Commerce & Visitors Bureau, representing close to 600 businesses throughout the Imperial Valley, wishes to register its official support for proposed expansion of the Mesquite Mine in Imperial County. 1.

As you know, the Imperial Valley has an unemployment rate hovering at about 27 - 30%, and the lowest per capita income in the state. 2. The expansion of Mesquite Mine will guarantee that up to 190 high paying jobs will be secure in Imperial County at least through 2006. With an annual payroll of $9.7 million, the mine is a significant employer in Imperial County. Keeping jobs here in the county also means money will continue to be circulated in our local community — helping to stimulate our local economy. 3.

4. Newmont Gold Company, operator of the Mesquite Gold Mine, is committed to thoroughly studying the environmental impacts, and will mitigate any impacts that may be identified through the EIS. With the assurance that measures to protect our environment are put into place, we believe it would be beneficial to the local area and economy to approve the proposed mine expansion.

5. Mining has been an important and beneficial contributor to the businesses represented by the Chamber for nearly 20 years. We look forward to the continued presence of mining as a good neighbor in Imperial County, and we encourage responsible development of the mineral resources at the Mesquite Mine. 6.

Sincerely,

Larry M. Bratton
President

Allen Tyler, Chair
Economic Development Committee

cc: Lisa Wade, Mesquite Mine

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...AND MANAGEMENT
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to

February 8, 1999

Field Manager
Bureau of Land Management
El Centro Field Office
1661 South 4th Street
El Centro, CA 92243
Attn: Geologist

Re: Mesquite Mine Proposed Expansion Scoping Comments

Dear Field Manager:

As I stood atop Osborne's Overlook on the Algodones Dunes, the view was marvelous, 360 degrees of purple mountains, craggy peaks, and - what is this? - dirty brown rectangles marring the otherwise perfect vista. Any Mesquite Mine expansion must be predicated on the removal of these eyesores!

1. Please have the Newmont Gold Company reclaim the viewshed so that the heap leach and overburden piles blend into the mountainous terrain as a pre-condition to the mine expansion.

Thank you very much for the opportunity to comment on the preparation of the draft EIS for the proposed expansion of the Mesquite Mine.

Sincerely,

Steven L. Hartman

Steven L. Hartman
6117 Reseda Blvd. Suite H
Reseda CA 91335

NOI

Thank 6

7 comment total

February 2, 1999

United States Department of the Interior
Bureau of Land Management
El Centro Resource Area
1661 South 4th Street
El Centro, California 92243-4561

1. I am appalled to learn of the proposed expansion of the Mesquite mine. What will the people of Imperial County get? What will the citizens of California receive? What will Americans gain? Only an incredibly large pit, a hole in the ground a mile wide, one that will never be restored to its original natural beauty.

2. The area into which the Mesquite Mine wants to expand has a long historical tradition as the Mesquite "Diggins'" and this historical tradition will be lost to historians of mining history.

3. There are many early man and pre-Columbian sites in the area, Native American sleeping circles, shrines, trails, and petroglyphs on the many rocks and boulders in the area. All will be lost.

4. Ecological and environmental concerns indicate destruction and danger, increased noise, dust, destruction of flora and fauna, more traffic, loss of open space and wilderness, and lowered water tables.

5 The mine currently has numerous problems which will be compounded if the expansion is allowed. For example, the mining operation cannot dispose of its own waste. Discarded oversized tires remain in gigantic piles on the site because the mining operators have found no feasible way to dispose of them. Mountains of crushed rock, actually several stories high, which remain after cyanide leaching, destroys the beauty of the area.

6 The mine proper is hemmed in with high fences and razor wire, under the pretense that the confines perserve the desert tortoise, a species the workmen have never seen! When driving along the highway the fencing reminds one of a state penitentiary, destroying the beauty of the desert so loved by tourists and residents alike. 7 We do not need this destruction of one of California's last wildernesses, the great desert and the Mesquite "Diggins.'"

Dr. Robert T. Fisher, Ed.D., J.D.
Instructor San Diego State University
Class: Gold in Them Thar Hills
1878 Rancho Jorie
Alpine, CA 91901
(619) 445-5537

NOI

(11)
2 total

Re: Mesquite Gold Mine Enlargement/Imperial County

r Manager Salt: 1/15/9

1 NO, no more mining by anyone in the desert. That land belongs to US, the people, you and me. There is no reason, other than greed, to give our land away to private parties, for their gain, and our loss.

So, get the Newmont Gold Company out of our land.

2 You are perfectly well aware, Mr. Salt, that the people want their land left alone. Why don't you follow their wishes? But, no, you permit the land's ruination by private parties for profit. WHY?

Most sincerely, F. Martin

Frances Martin
5711 Denny Avenue
North Hollywood, CA 91601

NOT

(12) 1 total

Brubaker-Mann, INC.
NATURAL COLORED CRUSHED ROCK

MINED AND MILLED IN BARSTOW, CALIF.
LARGE SELECTION OF NATURAL COLORS

36011 Soap Mine Road • Barstow, California 92311 • (760) 256-2520 • (760) 256-8317 • Fax (760) 256-0127

OFFICERS

Chairman of the Board
William J. Mann

President
Julie Mann

V.P. of Administration
Pauline Villareal

Secretary and
Chief Financial Officer
Dorothy E. Mann

January 14, 1998

Field Manager
Bureau of Land Management
El Centro Field Office
1661 South 4th Street
El Centro, CA 92243
ATTN: Geologist

Dear Sir:

I strongly support the expansion of the Mesquite Gold Mine, operated by Newmont Gold Company. I recommend that the EIS include the benefits to the economy that this project will provide.

Sincerely,

Julie Mann

Julie Mann
President

NOI

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SIERRA CLUB

California/Nevada RCC Mining Committee
P.O. Drawer W, Independence, CA 93526
Stan Haye, Chair. (619)

RECEIVED
BUREAU OF LAND MANAGEMENT
EL CENTRO, CA.

12/31/98

Field Manager
BLM El Centro Field Office
1661 S. 4th St
El Centro, CA 92243
Attn: Geologist

Dear Sir:

Please add our name to the mailing list for the expansion DEIS for the Mesquite mine in Imperial County.

Although we are interested in all of the issues surrounding this expansion, we are most concerned that the DEIS evaluate the costs and
1. other environmental consequences of complete or partial backfill of the existing and new pits. We believe that a significant opportunity exists for sequential backfilling, and believe this issue should be evaluated in detail.

Sincerely,

Stan Haye

Stan Haye

NOT

16

Scoping Comment Sheet
Mesquite Mine Expansion Project EIR/EIS

Please Print Legibly

Name: Edie Harmon

Organization: (if applicable) Sierra Club

Address: P.O. Box 444

Ocotillo CA 92259

Comments: Written comments will be submitted by the deadline. Please send written materials and a copy of the Draft EIS/EIR when available. I was unable to attend the scoping meetings because I was at the Wilderness And Land Restoration training Course in Nevada.

By filling out this comment form, you will be put on a mailing list to receive information regarding this project.

☐ Check here if you do not wish to be put on mailing list.

(1)

February 28, 1999

To: Field Manager, BLM ECFO, El Centro CA 92243 Attn.: Kevin Marty, Geologist

From: Edie Harmon, P.O. Box 444, Ocotillo, CA 92259

Re: Newmont Gold Co., Mesquite Mine Expansion, Scoping issues for Draft EIS/EIR

I appreciate the opportunity to submit written comment for consideration by Newmont Gold Company and for the Draft EIS/EIR for Newmont's proposed expansion of the Mesquite Gold Mine on Hwy 78 east of Glamis in Imperial County, CA. I am not familiar with the details of the proposed Mesquite mine expansion and I understand that there was no printed information provided at any of the Public scoping Meetings held in late January 1999. I was not able to attend any of the scoping meetings because they were at the same time as the training course on "Wilderness Arid Lands Restoration" which I attended in Nevada.

The issues addressed in these comments are result from having reviewed cyanide heap-leach, and open-pit mining operations in Imperial County, in other southern California locations and in Nevada, and having completed courses in mine reclamation (by Dr. Ray Franson at the Castle Mountain mine) and the 1/99 wilderness arid land restoration course conducted in Nevada by the Carhart Center. Both courses had intensive lectures in addition to spending a day in the field to view revegetation and restoration successes and learn what techniques worked best. I have also had the opportunity to visit the tall pot nurseries at Joshua Tree National Park and Castle Mountain Mine.

1. This proposal and other open pit operations and proposals have necessitated a review of the SMARA regulations, BLM's 3809 regulations, the adequacy of financial assurances and need for longer term bonding to enable reclamation work to be done by an independent third party contractor or by government employees. Such precautions are good policy in the event an operator abandons the mining operation or sells to another company which later abandons the site without completing reclamation or completing remediation to "clean-up" off-site adverse environmental impacts. Reclamation and reclamation bonding should be consistent with at least the minimum requirements of both SMARA and the anticipated changes in BLM's 3809 regs. There are numerous and well known mining operations which have shown the inadequacies of accessible financial assurances and bonding necessary for federal or state clean up.

Because Newmont has numerous profitable mining operations in Nevada at locations where groundwater issues are of major concern, I believe the company has both the financial resources and the expertise to make its expansion of the existing Mesquite Mine an example of what reclamation and clean-up can be done when a company exhibits the will to do what is necessary to undo some of the impacts that exist at the mine site and to minimize the long term consequences of its planned expansion. As we learned at the arid lands restoration course "the devil is in the details", but restoration can succeed because as BLM Arizona staff's closing restoration course comments stated, "the desert and mountains want restoration".

2. The Draft EIS/EIR should contain a chronological history of the Mesquite Mine and the associated permits, including dates granted and expiration or renewal dates. To which operator was each permit issued? Which, if any, of the existing permits will or may carry over to cover the expanded mining operations and increased production output without any changes or updates? Which agencies have jurisdiction over such permits, and what activities of the mine expansion trigger the necessity for amending or modifying said existing permits or approved Plans of Operation? 3. Does the mine expansion include increased output from the Mesquite Mine (both two existing pits or expansion of existing pit boundaries and a new pit site physically not connected to the existing pits), transport of ore and waste rock from the pit(s) where extraction will occur to a processing site or facility (heap-leach pile or ore processing structure), and the expanded or continued operations at the processing structure(s) prior to transport away from company owned and operated structures in Imperial County, CA? In other words will the Newmont Mesquite Mine operations be 4. reviewed as a single project or will they be impermissibly piecemealed? All operations associated with the mining and processing of the gold at Imperial County site should be considered as a single project and be the subject of a joint single NEPA/CEQA review process and all concerned and responsible public agencies should be provided with the NEPA/CEQA documentation at the beginning of the official comment period. 5.

What is the pattern of land ownership? Which lands are BLM managed, State lands or patented lands? Please provide a chronology of land transfers of public lands managed by BLM to either patented lands or State lands. What is the history of the state lands from early uses by native Americans to early gold exploration, withdrawal for military uses and transfer to the State? Will Newmont be continuing with plans for exploratory drilling on State lands not planned for development with the current expansion plans? If so, what is the time frame for that future exploration and or development? Any such plans should be considered a "reasonably foreseeable" actions as part of a cumulative impacts analysis.

What are the estimated proven and probable ore grades in the areas proposed for mining? It is assumed that the ore grade must be rich enough for mining to be profitable with the anticipated 3:1 strip ratio indicated in the BLM Public Notice. What is the break-even ore grade necessary for mining to be profitable at today's depressed gold prices and in compliance with all the current environmental regulations of the various federal, state and local requirements? If the open pit mine operations are to be conducted in association with pits on BLM managed lands will the claims pass a validity examination, whether or not required by BLM at the present time of patenting moratorium? Are the waste rock and heap leach piles to be located on existing patented lands? If not, does Newmont hold mill sites in the appropriate number and ratio to lode or placer claims to meet the mill site requirement of the mining law as spelled out in the recent Solicitor's Opinion and BLM Instruction Memorandum?

Past Mesquite Mine operators have significantly altered and degraded the once beautiful physical topography and denuded the area of a once rich and abundant diverse boulder strewn habitat with magnificent *Echinocactus polycephalus, Mammillaria tetrancistra, Opuntia basilaris*, chollas, ocotillos, numerous perennial shrubs on high ground interspersed with washes with mature and healthy specimens of microphyll woodland trees. No meaningful reclamation seems to have been required or completed. Furthermore, there appears to have been loss of downgradient mature ironwood trees as an unintended result of diversion of washes where mining activities have occurred.

What was the original hydrological profile in these downgradient washes and what is it today? Have downgradient and surrounding areas been dewatered by mining in or in close proximity to the original washes? If so, to what extent? What was the original water quality (both in terms of TDS and chemical profile) both under the various portions of the mining operation and downgradient? How has water quality been altered by the mining below the original water table and as a result of the formation of pit lakes in each pit? What is the water quality in each of the pit lakes and how does this impact downgradient water quality? How frequently are water quality/water chemistry analyses made of water in the pit lakes in each of the pits? To what extent does water quality in each of the pit lakes change over time? What are the impacts of altered water quality in pit lakes related to water quality in monitoring wells off-site? What are the long term (30 to 50 years) consequences on downgradient vegetation both in and out of the wash systems that are the result of pit lakes in this area? I recently learned that creosote roots have been found at a depth of 221 feet below surface. This means that native vegetation in non-wash areas may be impacted by both dewatering and by changes in water quality at considerable depth. Accordingly, it's extremely important to monitor downgradient and surrounding water levels and water quality.

Is off site downgradient loss of mature microphyll woodland vegetation related to diminished water table resulting from below gradient mining and diversion of washes or more the result of changed water quality resulting from existing Mesquite Mine operations? Did Newmont assume all the liabilities of former mine operators or can residual financial resources from bond requirements of previous operators be used to minimize those off-site adverse impacts on microphyll woodland vegetation?

Reclamation for the mine expansion should include frequently monitored and long term monitored test plots of significant size and in different locations to ascertain the most effective technique for revegetation at this location. So much terrain has already been impacted that there seems to be considerable acreage available to begin a revegetation test plot program at this time. For this site and its varying terrains and locations, which are the most effective techniques in conjunction with resoiling: ripping, pitting, planting tall (32-48") pot container grown trees and shrubs with deep roots in thoroughly wetted augered pits, vertical mulching, or other earlier customary attempts featuring mulching and hand broadcasting seed,

etc.? There should be annual written reports submitted with independent review so that successes or failures of different revegetation efforts can be shared. Such is part of the mitigation program at the Castle Mountain Mine in the East Mojave.

Reclamation must require stockpiling of topsoil by taking the uppermost surface of the living microorganisms and then the next several inches of soil for resoiling. Salvaged soils and crusts should be stored separately and kept completely dry so living material will remain dormant until resoiling occurs. Will salvaged soil materials be covered with waterproof covering or placed in white plastic buckets during the storage period? Will tall pot plants be grown from local or onsite collected seed at a nursery on site or grown from local or onsite seed at another nursery site? What is the definition of "local" seed? How far does "local" mean from the Mesquite Mine site? Will supplemental deep watering of tall pot plants be required at some test plots, if so with what frequency? Will it be on a schedule or determined by some monitoring criteria? If based on monitoring criteria, who determines the criteria? There should be independent third party or BLM biologist monitoring for revegetation reclamation success with specific set criteria.

Would Newmont consider making different terrains and locations at the Mesquite Mine available for researchers or university students to study revegetation techniques and to determine the best/most successful techniques for reclamation and restoration of low elevation hot desert areas? (There are tall pot creosote bushes transplanted in the Yuha that were observed still green more than 18 months without supplemental watering during a drought cycle.) There must be meaningful criteria for density, diversity and cover to conclude that reclamation is successful. Have the baseline vegetation studies been conducted, at the appropriate time of year and during both wet and dry years? There must be independent monitoring for revegetation success and the monitoring should continue for up to 30 years, estimated to be long enough to assure survival through several cycles of drought to be determined successful enough for bonding release. The 30 year period for revegetation success was the period repeatedly emphasized during the restoration course. If revegetation efforts do not survive a drought cycle, then another technique should be tried with continuing monitoring. Bonding should not be released for 30 years so if company efforts fail, revegetation efforts can be continued by government contract. (These are the messages we learned from the wilderness arid lands restoration training course!)

Where will baseline vegetation and wildlife surveys be conducted? Will surveys of the area be compared with surveys of comparable undisturbed off-site habitat nearby? What are the cumulative impacts of this and other mining operations in or adjacent to designated Critical Habitat for the threatened desert tortoise in Southern California? What is the success of desert tortoise mitigation measures, especially relocation of individual tortoises. What is the survival or mortality rates for relocated tortoises? Have relocated tortoises displaced tortoises already in habitat? Have the social interactions and health or survival of tortoises in the site of relocation been monitored? With what results? What are the criteria upon which USFWS makes its decision for jeopardy or non-jeopardy opinion for tortoise populations within an identified portion of critical habitat? What is the health status of the tortoise population within the Chuckwalla bench Critical habitat? Are numbers increasing or decreasing? What is the health status of this population? If decreasing, what are the suspected causes of the decline and what is the potential effect of expanding mining operations into critical habitat?

What are the potential impacts of increased dust deposition on both vegetative growth and wildlife forage in such a dry area where rains seldom rinse the dust off vegetation? Does increased dust deposition reduce photosynthetic capability such that the quality of wildlife forage and density of cover or shelter for wildlife including migratory birds are adversely impacted? Yes, there has been more than adequate dust suppression at the Mesquite Mine when visitors were known to be present, but I have also climbed the mine overlook and observed considerable clouds of particulate matter being churned airborne as the heavily laden trucks left the pit and as faster moving empty trucks returned to the pit. After some time at the overlook, water trucks always seemed to appear to begin rewatering the roads to suppress dust, but clouds of dust from the roads and from dumping waste rock and ore on their respective piles always seems to create visible particulate matter. With what frequency and at what locations are air quality monitoring conducted? Are these adequate, or will additional monitoring stations need to be sited to monitor the expansion of

operations? What are the background monitoring levels? How does background air quality change during times of heavy off-road vehicle use in the nearby South Algodones Dunes during winter holiday periods? Where are those additional ORV monitoring stations located and who is responsible for that monitoring? Is such data available for public review? It should be included in the upcoming DEIS/EIR because ORV activity is a major contributor to cumulative air quality impacts, even if such activity is not regulated. Which agency has regulatory authority or jurisdiction to air quality impacts of the ORV activity in Imperial County? Does increased particulates from agricultural operations, including soil preparation, travel on unpaved farm roads and agricultural burning impact background air quality monitoring at the Mesquite Mine site? If so, what is the percentage of impact attributed to agricultural operations in general and to agricultural burning specifically? Is background ambient air quality noticeably different at the mine site on agricultural burn versus non-burn days? How many days per month are mine operations shut down because of high wind conditions? Are any special measures taken to reduce airborne entrainment of dust from the waste rock piles and surrounding disturbed lands during high wind times? Are these measures deemed adequate to prevent off-site deposition of particulates and dust on off-site vegetation?

What is the depth of the proposed pit expansion? Will expansion be to greater depths or to expanded pit acreage? How will this expansion impact drainages and groundwater beneath the project site? See above for questions related to groundwater concerns.

Should there be reconsideration of diversion patterns for major washes? What, if anything can be done to stop the loss of off-site down-gradient mature microphyll woodland vegetation? Has loss of this vegetation and associated cover had an adverse impact on the local deer population using the area? If so how? Will expansion of the existing pits exacerbate the existing problems associated with disruption of the wash system and the subsurface groundwater flow? What is the estimated depth to groundwater in the various washes and upland habitat? The reclamation plan for the mine expansion should include attempts to reclaim and restore the off-site microphyll woodland vegetation that has been impacted by the existing Mesquite Mine. New, higher levels of bonding should be included and a more realistic revegetation and reclamation program should be part of the Mesquite Mine expansion and additional off site groundwater level and quality monitoring should be added and monitoring continued for 30 years because it may take a long time before off-site groundwater impacts are detected, simply because groundwater moves so slowly and patterns of groundwater movement through wash systems will be different from groundwater movement through the fractured bedrock both under the site and off-site. I specifically recommend that BLM request an independent analysis of the groundwater issues by Tom Myers, Ph.D., a Nevada groundwater geologist who specializes in mining impacts on groundwater systems. It is my understanding that Dr. Myers has done consulting work for BLM in Nevada, and he has reviewed the groundwater analysis for the nearby proposed Imperial Project.

Waste rock piles should be recontoured and so should leach piles after operations cease. It is critically important to require long term monitoring for revegetation survuval success of heap leach piles after cessation of use. To date there is no such long term monitoring data available from any mine. Initially there is likely to be good success after rinsing and breakdown of the leached cyanide solution and saturated piles. But what happens after moisture has all evaporated and this extremely porous substrate no longer has a residual high moisture content and residual nitrogen from the break-down of cyanide? What vegetation will survive over the 30 year monitoring period?

To what depths will pits be backfilled to ensure that they do not become the breeding grounds for tanarisk in this part of the desert? What efforts will be required to monitor for accidential introduction of invasive weed species in the pits and at the bases of abandoned piles of waste rock or leached ore?

How will the expanded mining operations impact the nearest designated wilderness areas and any proposed wilderness areas nearby? Please prepare a visual resources impacts analysis using view points from several locations abutting the Mesquite Mine perimeter fence on Hwy 78, not simply sites many miles away. What will be the view for those traveling along Hwy 78?

Are there important archeological and cultural resources and resource values that will be impacted by the planned mine expansion? Will there be off-site trail systems or other spiritual or cultural resource

values that will be potentially impacted by the planned mine? What mitigation is possible and how effective will it be? Will consultation with Native Americans, including the nearby Quechans or other tribes along the Colorado River be necessary? If so, please learn from the mistakes that were made in handling the consultation process at the proposed Imperial Project site.

What are the planned hours of operation? Please make sure that employees are not working such long periods that drivers fall asleep when driving large vehicles or while loading up on fuel at the mine site. These types of employee actions have been the cause of a number of accidents related to the handling of hazardous materials and spills that have been documented by BLM offices and at the Regional Water Quality Board files for a number of mines in Southern California.

Thank you for the opportunity to raise questions and share concerns. I look forward to another site visit at the Mesquite Mine. Please send copies of the Draft EIS/EIR and notices of all future public hearings. Please establish a public comment period that is the maximum rather than the minimum required by law.

cc:
CA OMR

Comment No.	Commentor — Date of Letter NOI Comment	Category	EIR/EIS Section / Remarks
	U.S. Environmental Protection Agency, Region IX — February 4, 1999		
1.	Provide baseline report regarding water resource status (chemical & physical), and known impacts to biological resources, related to current / past project activities. Strive to determine to what extent natural background conditions (non-mining related) influence the above-mentioned resources and impacts.	A	Chapters 3.2 &3.3
2.	Demonstrate that all reasonable alternatives to proposed actions have been examined.	A	Chapter 2.2
3.	Demonstrate appropriate mitigation measures have been thoroughly considered and incorporated into the project.	A	Chapter 4.1.X.3
4.	Provide substantial detail on the means of implementing mitigation measures.	A	Chapter 4.1.X.3
5.	Identify how monitoring would proceed to ensure compliance and assess effectiveness of mitigation.	A	Chapter 4.1.X.3
6.	Provide information (preferably in table format) on all applicable permits and responsible agencies.	A	Chapter 1.7
7.	Provide list of all used and generated hazardous materials.	A	Chapter 3.1.12
8.	Include a mitigation & monitoring table organized by resource category.	A	MMRP
9.	Rigorously explore and objectively evaluate all reasonable alternatives, including reasonable alternatives not within the jurisdiction of the BLM.	A	Chapter 2.2
10.	Address potential water quality and resource issues, and related biologic resources under description of affected environment, direct / indirect effects, environmental consequences, and cumulative impacts. Discuss observable trends.	A	Chapters 3.2 & 4.2.3.1
11.	Describe potential impacts on groundwater and surface water, estimating rates of water produced and / or consumed by the proposed project and other related projects.	A	Chapter 4.1.2.2
12.	Identify direct, indirect, and cumulative impacts to surface and groundwater flow, water supply wells, springs and seeps, vegetation, wildlife, and other groundwater-dependant resources as a result of groundwater pumping and any mine water / process water discharge	A	Chapters 4.1.2.2 & 4.2.3.1

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	associated with the proposed project.		
13.	Discuss any expected adverse impacts to down-wash riparian corridors from emplacement of diversion channels.	A	Chapter 4.1.2.2
14.	Provide a mitigation and monitoring plan if adverse impacts are expected.	A	Chapter 4.1.2.3
15.	For each alternative, discuss the project s compliance with state-adopted, EPA-approved water quality standards.	A	Chapter 4.1.2.2
16.	Project planning should be fully coordinated with all appropriate Federal and State offices to ensure water quality is protected and beneficial uses are maintained.	A	Chapters 1.7 and 6.0
17.	Discuss whether a National Pollution Elimination System (NPDES) permit would be required or exists for discharges to surface waters.	A	Chapter 1.7
18.	Note that under the Clean Water Act, any project disturbing a land area greater than five acres requires a storm water discharge permit.	A	Chapter 1.7
19.	Document the project s consistency with applicable storm water permitting requirements.	A	Chapter 4.1.2.2
20.	Provide a storm water pollution prevention plan.	C	SWPPPs are prepared upon completion of environmental review and preparation of final construction plans and specifications; therefore, it is premature to prepare a SWPPP at this time. Best Management Practices to control stormwater pollution will be identified in Chapter 4.1.2.3 of this EIR/EIS.
21.	Discuss specific mitigation measures that may be necessary.	A	Chapter 4.1.X.3
22.	Describe the original (natural) drainage patterns in the project locale, as well as drainage patterns of the area during project operations and following reclamation.	A	Chapters 2.1.5 & 3.2
23.	Include hydrologic and topographic maps of the areas.	A	Chapter 3.2 & Appendix B
24.	Discuss effects of the project on erosion potential and sedimentation.	A	Chapters 3.2.2 & 4.1.2.2
25.	Identify whether any project components would fall within 50 or 100 year flood plains.	A	Chapter 4.1.2.2
26.	Discuss potential for flash floods to transport sediment from disturbed areas to stream channels.	A	Chapter 4.1.2.2
27.	Discuss how accidental releases of hazardous materials, including	A	Chapters 2.1.8 & 4.1.2.2

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	pipe rupture or overflow from ponds, would be handled and are being handled.		
28.	Identify potential impacts resulting from failure of components of the solution containment systems and leaching facilities, methods for discovering such failures, and the degree to which impacts would be reversible.	A	Chapter 4.1.12
29.	Include acid generation / neutralization potential and potential for meteoric water to leach toxic constituents from wallrock, waste rock, stockpiles, tailings, and backfill at the site, and appropriate mitigation measures.	A	Chapter 2.1.2.2
30.	Discuss whether or not sulfide ore or waste is recognized or anticipated to be excavated in the future.	A	Chapter 2.1.2.2
31.	Describe applicable leach tests (e.g. meteoric mobility) to be conducted on ore and waste rock and test data, including sample locations.	A	Chapter 2.1.2.2
32.	Under cumulative impacts, describe the quality of waters at any other mining sites nearby.	A	Chapter 4.3.3.1
33.	Include a Waste Rock Characterization and Disposal Plan or an appropriate summary.	B	Appendix D-2
34.	Describe the proposed facility design and operation, and maintenance and monitoring activities, to ensure integrity of facilities throughout project.	A	Chapter 2.1.2.2 & Appendix B
35.	Note locations of all points of compliance and monitoring wells on site, including screening intervals, parameters to be monitored, and monitoring frequencies.	A	Chapter 2.1.2.4
36.	Discuss if any of the open pits would extend below the existing water table, and if so, whether a future pit lake would be likely to develop.	A	Chapters 4.1.2.2
37.	If any pit lakes are likely to develop, EPA encourages a reclamation option to backfill above the water table. If this is economically unfeasible (demonstrate economic unfeasibility), then analyze expected pit lake chemistry and potential adverse impacts to beneficial uses, including biologic resources.	A	Chapter 4.1.2.2 & Appendix D-2
38.	Consult the Army Corps of Engineers to determine if any component of the proposed project requires a Section 404 permit under the CWA. (Section 404 of the CWA regulates the discharge of dredge or fill material into waters of the U.S.)	A	Chapters 1.6.1.5 & 2.4.5
39.	EPA recommends avoidance of Waters of the U.S. and encourages	A	Chapters 2.4.1 & 2.4.5

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	BLM to explore alternatives that avoid siting of project facilities in waters of the U.S.		
40.	If a Section 404 permit is required, EPA will review the project for compliance with Federal Guidelines for Specification of Disposal Sites for Dredged or Fill Materials (40 CFR 230), promulgated pursuant to Section 404(b)(10) of the Clean Water Act.	A	Chapters 1.6.1.5 & 2.4.5
41.	Pursuant to 40 CFR 230, any permitted discharge into waters of the U.S. must be the least environmentally damaging practicable alternative to achieve the project purpose.	A	Chapter 2.4.5
42.	If, under the proposed project, dredged or fill material would be discharged into waters of the U.S., discuss alternatives to avoid those discharges.	A	Chapter 2.4
43.	Rigorously discuss alternatives to show compliance with the CWA 404 Guidelines.	A	Chapter 2.4
44.	If a discharge into waters of the U.S. cannot be avoided, discuss how remaining impacts would be minimized and mitigated. Discussion should include: 1. Assessment of the area impacted by type, function, & habitat; 2. Acreage & habitat type & function of waters of the U.S. that would be created or restored; 3. Water sources to maintain the mitigation area; 4. Revegetation plans including the numbers & age of each species to be planted; 5. Maintenance & monitoring plans, including performance standards to determine mitigation success; 6. Size & location of mitigation zones; 7. Parties that would ultimately be responsible for the plan s success; and 8. Contingency plans & financial assurance that would be enacted to avoid habitat losses due to the lag time between occurrence of the impact & successful mitigation.	A	Chapters 4.1.2.2, 4.1.2.3, 4.1.3.3, 4.1.3.4 & Appendix B
45.	Work closely with U.S. Fish & Wildlife Service and the California Department of Fish and Game to determine existing and future impacts of the project on plant and wildlife species, especially species classified rare, threatened, or endangered on either state or federal lists.	A	Chapter 4.1.3.3
46.	Provide information on potential impacts to candidate species.	A	Chapter 4.1.3.3

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47.	EPA encourages BLM to complete the consultation process with FWS prior to completion of the Final EIS.	A	Chapter 6.2.1
48.	Particular attention should be paid to potential adverse impacts to birds from cyanide-bearing solutions.	C	All ponds/channels are covered.
49.	Any history or case studies documenting previous adverse effects to birds should be noted, and appropriate mitigation measures discussed.	C	All ponds/channels are covered.
50.	Identify riparian habitat as well as other unique or important habitat areas that could be affected by the project.	A	Chapter 4.1.3.3
51.	If applicable, discuss avoidance, minimization, and mitigation of losses or modification of habitat and plant and animal species composition, and include a detailed mitigation plan.	A	Chapters 4.1.3.3 & 4.1.3.4
52.	Address potential cumulative impacts to resources, considering the proposed project in the context of past, current, and reasonably foreseeable future mining and other activities in the project vicinity.	A	Chapter 4.3
53.	In the cumulative impact section, include discussion of impacts to water and air quality, hydrology, soils, vegetation, wildlife, biodiversity and human health.	A	Chapter 4.3
54.	According to the CEQ Report, *Considering Cumulative Effects Under the National Environmental Policy Act,* the principles of cumulative impacts analysis are: inclusion of past, present and future actions; inclusion of federal, nonfederal, and private actions; focus on each affected resource, ecosystem, and human community; and focus on truly meaningful effects. Determination of the affected environment should not be based on a predetermined geographic area, but rather on perception of meaningful impacts and natural boundaries.	A	Chapter 4.3
55.	Discuss if the project is in an attainment area for priority air pollutants.	A	Chapters 3.8 & 4.1.8.5
56.	Discuss the National Ambient Air Quality Standards (NAAQS) and Prevention of Significant Deterioration (PSD) increments applicable to air quality in the project area. PSD increments exist for sulfur dioxide, total suspended particulates, and oxides of nitrogen.	A	Chapters 3.8 & 4.1.8.5
57.	Discuss impacts to the NAASQ and PSD increments from estimated emissions, considering the cumulative effects from all aspects of mine excavation, construction, operation, and support activities, such as vehicle traffic.	A	Chapter 4.1.8.5

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58.	Closely coordinate with the appropriate California air pollution control district regarding regulatory requirements and controls.	A	Chapters 1.4.2, 3.8.2 & 6.2
59.	Discuss whether a PSD permit will be required for the project and discuss and mitigation measures necessary to comply with NAASQ and PSD.	A	Chapter 4.1.8.5
60.	PSD increments are highly protective of air quality in Class I areas such as wilderness and national parks. Identify and Class I PSD areas located within at least 100 kilometers of the proposed project site.	A	Chapter 3.8.2.2
61.	Class I areas further than 100 kilometers could potentially be affected as well. The BLM should consult with the U.S. Forest Service and the National Park Service for a determination of which areas could be adversely affected by the proposed action.	A	Chapter 3.8.2.2
62.	Potential impacts to Class I PSD areas, including visibility impacts, should be discussed.	A	Chapter 4.1.8.5
63.	Since the Clean Air Act prohibits federal approval of a project for which conformity with the State Implementation Plan (SIP) cannot be assured, the EIS should explain how the proposed project is in conformity with the California SIP.	A	Chapter 4.1.8.5
64.	Discuss the possibility of an air quality monitoring program that would be implemented to ensure project compliance with all applicable air quality standards and permits.	A	Chapter 3.8
65.	Discuss the following components of reclamation: 1. A detailed account of measures taken to decommission mine operations, and neutralize or cap waste rock, tailings, and other process facilities; 2. Identification (including estimated acreage) of the areas targeted for reclamation, and clarification of the intended degree of treatment in each area: 3. Estimation of any irrigation requirements; 4. Timing of reclamation relative to mining operations and duration of reclamation treatment; 5. Standards for determining and means of assuring successful reclamation; 6. Means of assuring that any maintenance required for reclaimed areas would continue after operations cease or while operations are suspended.	A	Chapter 2.1.6 & Appendix B

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66.	Recommend that BLM require revegetation be accomplished with only native species indigenous to the area in order to restore the ecosystem to as natural a state as possible after mine closure.	A	Chapter 2 & Appendix B
67.	Recommend that BLM monitor and enforce revegetation success for at least five years following revegetation efforts. First or second year success in meeting the revegetation standards is not necessarily indicative of long-term success.	A	Chapter 2.1.7 & Appendix B
68.	Discuss provisions that would be made for post-operation surveillance to ensure that neutralization and / or stabilization of mining waste sites has been effective.	A	Chapter 2.1.7 & Appendix B
69.	Describe the mitigation actions that would be taken should destabilization or contamination be detected, and identify who would be responsible for these actions.	A	Chapters 1.6.2.1, 2.1.7, 4.1.2.2, 4.1.12.3 & Appendix B
70.	Specify the bonding requirements to ensure that appropriate funding is available for reclamation should the mining company fail to carry out all required reclamation activities and identify who would be responsible for any post-closure cleanup actions should they be necessary.	A	Chapters 2.1.4.2 & 4.1.13.2
71.	Recommend BLM review bonding requirements for early mine closure contingency and handling of pit lakes.	A	Chapters 2.1.4.2 & 4.1.13.2
72.	In keeping with Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (EO 12898), the EIS should describe the measures taken by the BLM to: 1. Fully analyze the environmental effects of the proposed federal action on minority communities and low-income populations: 2. Present opportunities for affected communities to provide input into the NEPA process.	C	There would be no adverse offsite impacts to such groups.
73.	State whether the analysis meets requirements of your agency s environmental justice strategy.	C	See Comment No. 72
74.	Indicate efforts made by the BLM to enter into government to government consultations with potentially affected Tribes, particularly in regard to sacred sites and traditional cultural properties. Results of those consultations should be presented in the EIS.	A	Chapter 6.2.3
75.	Discuss Federal trust responsibilities.	A	Chapter 1.5
76.	Conduct a thorough archeological and paleontological survey.	A	Chapter 3.4 & 3.5

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77.	Refer to appropriate BLM natural resource and land use plans and in particular, identify any special uses that would be displaced by the proposed project, and discuss the proposed project s specific potential impacts to these uses.	A	Chapter 4.1.9.2
78.	BLM and Newmont should note that on May 1, 1997, EPA added metal mining to the list of industries that will be subject to the reporting requirements of section 313 of the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA) and section 6607 of the Pollution Prevention Act of 1990. (See 40 CFR Part 372, Addition of Facilities in Certain Industry Sectors; Revised Interpretation of Otherwise Use: Toxic Release Inventory Reporting; Community Right-to-Know; Final Rule, Federal Register: May 1, 1997, pages 23833-23892). Reporting for mining facilities will be effective beginning with the 1998 reporting year. The first reports from all metal mining facilities must be submitted to EPA and the State by July 1, 1999.	C	BLM and Newmont are aware of these new regulations. EPA has not requested that this information be provided in the EIR/EIS; therefore, no further action is warranted.
	El Centro Chamber of Commerce and Visitors Bureau — February 8, 1999		
1.	El Centro Chamber of Commerce & Visitors Bureau registers its official support for proposed expansion of the Mesquite Mine in Imperial County.	C	Support for the project is noted. No further action is warranted.
2.	Mine expansion will guarantee that up to 190 high paying jobs will be secure in Imperial County at least through 2006.	A	Chapter 4.1.13.2
3.	Mine expansion will help stimulate our local economy.	A	Chapter 4.1.13.2
4.	Newmont Gold Company is committed to thoroughly studying the environmental impacts and will mitigate any impacts that may be identified through the EIS.	C	This comment is noted. No further action is warranted.
5.	Mining has been an important and beneficial contributor to the businesses represented by the Chamber for nearly 20 years.	A	Chapter 3.13
6.	The Chamber encourages the responsible development of the mineral resources at the Mesquite Mine.	C	Support for the project is noted. No further action is warranted.
	Steven L. Hartman — February 8, 1999		
1.	Newmont Gold Company must reclaim the viewshed so that the heap leach and overburden piles blend into the mountainous terrain.	A	Chapter 4.1.11.2

	Dr. Robert T. Fisher, Ed.D., J.D., Instructor San Diego State University		
1.	Appalled to learn of the proposed expansion of the Mesquite mine.	C	Opposition to the project is noted. No further action is warranted.
2.	The area into which the Mesquite Mine wants to expand has a long historical tradition as the Mesquite Diggins and this historical tradition will be lost to historians of mining history.	A	Chapters 3.4, 4.1.4.3 & Appendix F
3.	There are many early man and pre-Columbian sites in the area, Native American sleeping circles, shrines, trails, and petroglyphs on the many rocks and boulders in the area. All will be lost.	A	Chapters 3.4, 4.1.4.3 & Appendix F
4.	Ecological and environmental concerns indicate destruction and danger, increased noise, dust, destruction of flora and fauna, more traffic, loss of open space and wilderness, and lowered water tables.	A	Chapters 4.1.2.2, 4.1.3.3, 4.1.6.2, 4.1.7.2, 4.1.8.4, 4.1.9.2, 4.1.12.2 & Appendix D-3
5.	The mine currently has numerous problems that will be compounded if the expansion is allowed. For example, the mining operation cannot dispose of its own waste. 1. Discarded oversized tires remain in gigantic piles on the site because the mining operators have found no feasible way to dispose of them. 2. Mountains of crushed rock, actually several stories high, which remain after cyanide leaching, destroys the beauty of the area.	A	Chapter 4.1.11.2 & 4.1.14.2
6.	The mine proper is hemmed-in with high fences and razor wire, under the pretense that the confines preserve the desert tortoise, a species the workmen have never seen! When driving along the highway, the fencing reminds one of a state penitentiary, destroying the beauty of the desert so loved by tourists and residents alike.	A	Chapter 4.1.11.2
7.	We do not need this destruction of one of California s last wildernesses, the great desert and the Mesquite Diggins.	A	Chapter 4.1.4.3 & Appendix F
	Frances Martin, North Hollywood, California — January 15, 1999		
1.	No, no more mining by anyone in the desert. That land belongs to us, the people, you and me. There is no reason, other than greed, to give our land away to private parties, for their gain, and our loss. Get	C	Opposition to the project is noted. No further action is warranted.

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	the Newmont Gold Company out of our land.		
2.	You are perfectly aware that the people want their land left alone. Why don t you follow their wishes? But, no, you permit the land s ruination by private parties for profit. Why?	C	Opposition to the project is noted. No further action is warranted.
	Brubaker-Mann, Inc., Barstow, California, Julie Man, President — January 14, 1999		
1.	I strongly support the expansion of the Mesquite Gold Mine, operated by Newmont Gold Company. I recommend that the EIS include the benefits to the economy that this project will provide.	A	Chapter 4.1.13.2
	Sierra Club, California / Nevada RCC Mining Committee, Independence, California — December 31, 1998		
1.	We are most concerned that the DEIS evaluate the costs and other environmental consequences of complete or partial backfill of the existing new pits. We believe that a significant opportunity exists for sequential backfilling, and believe this issue should be evaluated in detail.	A	Chapter 2.4.2.1 & Appendix D-2
	Sierra Club, Ocotillo, California — February 28, 1999		
1.	This proposal and other open pit operations and proposals have necessitated a review of the SMARA regulations, BLM s 3809 regulations, the adequacy of financial assurances and need for longer term bonding to enable reclamation work to be done by an independent third party contractors or by government employees. Such precautions are good policy in the event an operator abandons the mining operation or sells to another company which later abandons the site without completing reclamation or completing remediation to clean-up off-site adverse environmental impacts. Reclamation and reclamation bonding should be consistent with at least the minimum requirements of both SMARA and the anticipated changes in BLM s 3809 regulations. There are numerous and well known mining operations which have shown the inadequacies of accessible financial assurances and bonding necessary for federal or state clean-up.	A	Chapter 2.1.4.2 & 4.1.13.3
2.	The Draft EIS / EIR should contain a chronological history of the	A	Chapter 1.3.4

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	Mesquite Mine and the associated permits, including dates granted and expiration or renewal dates. To which operator was each permit issued? Which, if any, of the existing permits will or may carry over to cover the expanded mining operations and increased production output without any changes or updates? Which agencies have jurisdiction over such permits, and what activities of the mine expansion trigger the necessity for amending or modifying said existing permits or approved Plans of Operation?		
3.	Does the mine expansion include: 1. Increased output from the Mesquite Mine (Both existing pits or expansion of existing pit boundaries and a new pit site physically not connected to the existing pits); 2. Transport of ore and waste rock from the pit(s) where extraction will occur to a processing site or facility (heap-leach pile or ore processing structure); and 3. The expanded or continued operations at the processing structure(s) prior to transport away from company-owned and operated structures in Imperial County, California?	A	Chapter 2.1.2 & 2.1.3
4.	Will the Newmont Mesquite Mine operations be reviewed as a single project or will they be impermissibly piecemealed? All operations associated with the mining and processing of gold at the Imperial County site should be considered as a single project and be the subject of a joint single NEPA / CEQA review process.	A	Chapter 1.1
5.	All concerned and responsible public agencies should be provided with the NEPA / CEQA documentation at the beginning of the official comment period.	C	All agencies that are known by Imperial County and the BLM to have jurisdiction over aspects of the project or otherwise are interested in the project will be provided with the EIR/EIS at the beginning of the official comment period.
6.	What is the pattern of land ownership? Which lands are BLM managed, state lands or patented lands?	A	Figure 1.3-4
7.	Please provide a chronology of land transfers of public lands managed by BLM to either patented lands or State lands.	C	BLM to provide.
8.	What is the history of the state lands from early uses by native Americans to early gold exploration, withdrawal for military uses	A	Appendix F

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	and transfer to the State?		
9.	Will Newmont be continuing with plans for exploratory drilling on state lands now planned for development with the current expansion plans? If so, what is the time frame for that future exploration and / or development? Any such plans should be considered reasonably foreseeable actions as part of a cumulative impacts analysis.	A	Chapters 1.3.4, 2.1.1 & 2.1.3
10.	What are the estimated proven and probable ore grades in the areas proposed for mining? It is assumed that the ore grade must be rich enough for mining to be profitable with the anticipated 3:1 strip ratio indicated in the BLM public Notice.	A/C	Chapter 2.4.4/Proprietary information that the company provides if deemed necessary.
11.	What is the break-even ore grade necessary for mining to be profitable at today s depressed gold prices and in compliance with all the current environmental regulations of the various federal, state, and local requirements?	A/C	Chapter 2.4.4/Proprietary information that the company provides if deemed necessary.
12.	If the open pit mine operations are to be conducted in association with pits on BLM managed lands, will the claims pass a validity examination, whether or not required by BLM at the present time of patenting moratorium? Are the waste rock and heap leach piles to be located on existing patented lands? If not, does Newmont hold mill sites in the appropriate number and ratio to lode or placer claims to meet the mill site requirement of the mining law as spelled out in the recent Solicitor s Opinion and BLM Instruction Moratorium?	A/C	Chapter 1.1/If sensitive resources would not potentially be impacted by a mining plan, BLM has no reason to conduct a validity examination if they are not exercising any rights or interests in the land against the claimant. Prior to the patent moratorium, mining claimants could seek patent on their claims if they met certain requirements. The patent process is not done to determine the validity of mining claims, but is a distinct process to transfer title of land to a private entity, which is allowed under the General Mining Law.
13.	What was the original hydrological profile in these downgradient washes and what is it today?	A	Chapters 3.1.2, 4.1.1.2 & 4.1.2.2
14.	Have downgradient and surrounding areas been dewatered by mining in or in close proximity to the original washes? If so, to what extent?	A	Chapters 3.1.2 & 3.2.3 & Appendix D-2
15.	What was the original water quality (both in terms of TDS and	A	Chapters 2.1.2.2 & 4.1.2.2 &

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	chemical profile) both under the various portions of the mining operation and downgradient?		Appendix D-2
16.	How has water quality been altered by the mining below the original water table and as a result of the formation of pit lakes in each pit?	A	Chapter 3.2.3.5 & Appendix D-2
17.	What is the water quality in each of the pit lakes and how does this impact downgradient water quality?	A	Chapters 3.1.2 & 3.2.3.5 & Appendix D-2
18.	How frequently are water quality / water chemistry analysis made of water in the pit lakes in each of the pits?	A	Chapters 2.1.2.4 & 3.1.2 & Appendix D-2
19.	To what extent does water quality in each of the pit lakes change over time?	A	Chapter 3.2.3.5
20.	What are the impacts of altered water quality in pit lakes related to water quality in monitoring wells off-site?	A	Chapters 2.1.2.4 & 4.2.2
21.	What are the long-term (30 to 50 years) consequences on downgradient vegetation both in and out of the wash systems that are the result of pit lakes in this area?	A	Chapter 4.2.2
22.	I recently learned that creosote roots have been found at a depth of 221 feet below surface. This means that native vegetation in non-wash areas may be impacted by both dewatering and by changes in water quality at considerable depth. Accordingly, it is extremely important to monitor downgradient and surrounding water levels and water quality.	A	Chapters 4.1.2.2 & 4.1.3.3
23.	Is off-site downgradient loss of mature microphyll woodland vegetation related to diminished water table resulting from below gradient mining and diversion of washes or more the result of changed water quality resulting from existing Mesquite Mine operations?	A	Chapter 4.1.3.3 & Figure 4.1.3-1 & Appendix E-2
24.	Did Newmont assume all the liabilities of former mine operators or can residual financial resources from bond requirements of previous operators be used to minimize those off-site adverse impacts on microphyll woodland vegetation?	A	Chapters 2.1.4.2, 4.1.13.2 & 4.1.13.3
25.	Reclamation for the mine expansion should include frequently monitored and long-term monitored test plots of significant size and in different locations to ascertain the most effective technique for revegetation at this location. So much terrain has already been impacted that there seems to be considerable acreage available to begin a revegetation test plot program at this time.	A	Chapter 2.1.7 & Appendix B
26.	For this site and its varying terrain and locations, which are the most	A	Appendix B

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	effective techniques in conjunction with resoiling, ripping, pitting, planting tall (32-48) container grown trees and shrubs with deep roots in thoroughly wetted augured pits, vertical mulching, or other earlier customary attempts featuring mulching and hand broadcasting seed, etc? There should be annual written reports submitted with independent review so that successes or failures of different revegetation efforts can be shared. Such is part of the mitigation program at the Castle Mountain Mine in the East Mojave.		
27.	Reclamation must require stockpiling of topsoil by taking the uppermost surface of the living microorganisms and the next several inches of soil for resoiling. Salvage soils and crusts should be stored separately and kept completely dry so living material will remain dormant until resoiling occurs.	A	Chapter 2.1.7 & Appendix B
28.	Will salvaged soil materials be covered with waterproof covering or placed in white plastic buckets during the storage period?	A	Appendix B
29.	Will tall pot plants be grown from local or onsite collected seed at a nursery on site or grown from local or onsite seed at another nursery site?	A	Chapter 2.1.7 & Appendix B
30.	What is the definition of local seed? How far does local mean from the Mesquite site?	A	Chapter 2.1.7 & Appendix B
31.	Will supplemental deep watering of tall pot plants be required at some test plots, if so with what frequency? Will it be on a schedule or determined by some monitoring criteria? If based on monitoring criteria, who determines the criteria? There should be independent third party or a BLM biologist monitoring for revegetation reclamation success with specific, set criteria.	A	Chapter 2.1.7 & Appendix B
32.	Would Newmont consider making different terrain and locations at the Mesquite Mine available for researchers or university students to study revegetation techniques and to determine the best / most successful techniques for reclamation and restoration of low elevation, hot desert areas?	C	Making terrain and locations available for research may be considered by Newmont. This activity would not mitigate any impacts associated with the proposed project/action; and therefore, will not be addressed in this EIR/EIS.
33.	There must be meaningful criteria for density, diversity, and cover to conclude that reclamation is successful	A	Chapter 2.1.7 & 4.1.3.3 & Appendix B
34.	Have the baseline vegetation studies been conducted, at the	A	Chapter 2.1.7 & Appendix B

	appropriate time of year and during both wet and dry years?		
35.	There must be independent monitoring for revegetation success and the monitoring should continue for up to 30 years, estimated to be long enough to assure survival through several cycles of drought to be determined successful enough for bonding release.	B	Chapters 2.1.7 & 4.1.3.3 & Appendix B
36.	If revegetation efforts do not survive a drought cycle, then another technique should be tried with continuing monitoring. Bonding should not be released for 30 years, so if company efforts fail, revegetation efforts can be continued by government contract.	B	Chapter 2.1.7 & 2.1.8 & Appendix B
37.	Where will baseline vegetation and wildlife surveys be conducted?	A	Chapters 2.1.7 & 3.3
38.	Will surveys of the area be compared with surveys of comparable undisturbed off-site habitat nearby?	A	Chapters 2.1.7 & 3.3 & Appendix B
39.	What are the cumulative impacts of this and other mining operations in or adjacent to designated Critical Habitat of the threatened desert tortoise in Southern California?	A	Chapter 4.3.3.2
40.	What is the success of desert tortoise mitigation measures, especially relocation of individual tortoises? What is the survival or mortality rate for relocated tortoises?	C	The appropriate agency is currently reviewing this issue.
41.	Have relocated tortoises displaced tortoises already in habitat? Have the social interactions and health or survival of tortoises in the site of relocation been monitored? With what results?	C	The appropriate agency is currently reviewing this issue.
42.	What are the criteria upon which U.S. Fish and Wildlife makes its decision for jeopardy or non-jeopardy opinion for tortoise populations within an identified portion of Critical Habitat?	C	The appropriate agency is currently reviewing this issue.
43.	What is the health status of the tortoise population within the Chuckwalla Bench Critical Habitat?	C	The appropriate agency is currently reviewing this issue.
44.	Are overall desert tortoise numbers increasing or decreasing?	C	The appropriate agency is currently reviewing this issue.
45.	What is the health status of the population within the Chuckwalla Bench Critical Habitat?	C	The appropriate agency is currently reviewing this issue.
46.	If decreasing, what are the suspected causes of the decline and what is the potential effect of expanding mining operations into Critical Habitat?	C	The appropriate agency is currently reviewing this issue.
47.	What are the potential impacts of increased dust deposition on both vegetative growth and wildlife forage in such a dry area where rain seldom rinses the dust off of the vegetation?	A	Chapter 4.1.3.3
48.	Does increased dust deposition reduce photosynthetic capability such	A	Chapter 4.1.3.3

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	that the quality of wildlife forage and density of cover or shelter for wildlife, including migratory birds, is adversely impacted?		
49.	With what frequency and at what locations are air quality monitoring conducted?	A	Chapter 3.8
50.	Are these adequate, or will additional monitoring stations need to e sited to monitor the expansion of operations?	A	Chapter 3.8
51.	What are the background air quality monitoring levels?	A	Chapter 3.8.2
52.	How does background air quality change during times of heavy off-road vehicle (ORV) use in the nearby South Algodones Dunes during winter holiday periods?	A	Chapter 3.8.4.3
53.	Where are additional ORV monitoring stations located and who is responsible for that monitoring? Is such data available for public review? It should be included in the upcoming DEIS / EIR because ORV activity is a major contributor to cumulative air quality impacts, even if such activity is not regulated.	B	Chapter 3
54.	Which agency has regulatory authority or jurisdiction over air quality impacts of the ORV activity in Imperial County?	B	Chapter 3
55.	Does increased particulate matter from agricultural operations, including soil preparation, travel on unpaved farm roads, and agricultural burning impact background air quality monitoring at the Mesquite Mine site? If so, what is the percentage of impact attributed to agricultural operations in general and to agricultural burning specifically?	C	Irrelevant to this document.
56.	Is background ambient air quality noticeably different at the mine site on agricultural burn versus non-burn days?	B	Chapter 3
57.	How many days per month are mine operations shut down because of high wind conditions?	C	Not part of their permit.
58.	Are there any special measures taken to reduce airborne entrainment of dust from the waste rock piles and surrounding disturbed lands during high wind times? Are these measures deemed adequate to prevent off-site deposition of particulates and dust on off-site vegetation?	A	Chapter 4.1.8.6
59.	What is the depth of the proposed pit expansion?	A	Chapter 2.1.4
60.	How will this expansion impact drainages and groundwater beneath the project site?	A	Chapter 4.1.2.2 and Appendix D-2
61.	Should there be reconsideration of diversion patterns for major washes?	A	Chapters 2.1.4.3 and 4.1.2.2

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62.	What, if anything, can be done to stop the loss of off-site down gradient mature microphyll woodland vegetation?	A	Chapter 4.1.3.3 & Figure 4.1.3-1 & Appendix E-2
63.	Has the loss of this vegetation and associated cover had an adverse impact on the local deer population using the area? If so, how?	B	Chapter 3.1.3.2
64.	Will expansion of the existing pits exacerbate the existing problems associated with disruption of the wash system and the subsurface groundwater flow?	A	Appendix D-2
65.	What is the estimated depth to groundwater in the various washes and upland habitat?	A	Chapter 3.2.3
66.	The reclamation plan for the mine expansion should include attempts to reclaim and restore the off-site microphyll woodland vegetation that has been impacted by the existing Mesquite Mine.	A	Chapter 2.1.7 and Appendix B
67.	New, higher levels of bonding should be included and a more realistic revegetation and reclamation program should be part of the Mesquite Mine expansion.	A	Chapter 2.1.7 & Appendix B
68.	Additional off-site groundwater level and quality monitoring should be added. Monitoring should be continued for 30 years because it may take a long time before off-site groundwater impacts are detected. Groundwater moves so slowly and patterns of groundwater movement through wash systems will be different from groundwater movement through the fractured bedrock both under the site and off-site.	A	Appendix D-2
69.	I specifically recommend that BLM request an independent analysis of groundwater issues by Tom Myers, Ph.D., a Nevada groundwater geologist who specializes in mining impacts on groundwater systems. It is my understanding that Dr. Myers has done consulting work for BLM in Nevada, and he has reviewed the groundwater analysis for the nearby, proposed Imperial Project.	A/C	Appendix D-2/Issue reviewed by professional staff at the appropriate agency.
70.	Waste rock piles and leach piles should be recontoured after operation cease. It is critically important to require long-term monitoring for revegetation survival success of heap leach piles after cessation of use. To date there is no such long-term monitoring data available from any mine. Initially there is likely to be good success after rinsing and breakdown of the leached cyanide solution and saturated piles. What happens after moisture has evaporated and this extremely porous substrate no longer has a residual high moisture content and residual nitrogen from the breakdown of cyanide? What	A	Chapter 2.1.7 and Appendix B

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	vegetation will survive over the 30-year monitoring period?		
71.	To what depths will pits be backfilled to ensure they do not become the breeding grounds for tamarisk in this part of the desert?	A	Chapters 2.4.2.1 & 2.1.7
72.	What efforts will be required to monitor for accidental introduction of invasive weed species in the pits and at the bases of abandoned piles of waste rock or leached ore?	A	Chapters 2.1.7 & 4.1.3.3
73.	How will the expanded mining operations impact the nearest designated wilderness areas and any nearby proposed wilderness areas?	A	Chapter 4.1.10.2
74.	Please prepare a visual resources impacts analysis using view points from several locations abutting the Mesquite Mine perimeter fence on Highway 78, not simply sites many miles away. What will be the view for those traveling along Highway 78?	A	Chapter 4.1.11.2
75.	Are there important archaeological and cultural resource values that will be impacted by the planned mine expansion?	A	Chapter 4.1.4.3
76.	Will there be off-site trail systems or other spiritual or cultural resource values that will be potentially impacted by the planned mine? What mitigation is possible and how effective will it be?	A	Chapter 4.1.4.3
77.	Will consultation with Native Americans, including the nearby Quechans or other tribes along the Colorado River be necessary? If so, please learn from the mistakes that were made in handling the consultation process at the proposed Imperial Project site.	A	Chapter 6
78.	What are the planned hours of operation?	A	Chapter 1.3.2.2
79.	Please make sure that employees are not working such long periods that drivers fall asleep when driving large vehicles or while loading up on fuel at the mine site. These types of employee actions have been the cause of a number of accidents related to the handling of hazardous materials and spills that have been documented by BLM offices and at the Regional Water Quality Board files for a number of mines in Southern California.	A	Chapter 4.1.12.2

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Summary of NOP Responses

Planning Department

COUNTY OF IMPERIAL

Jurg Heuberger, AICP - Director

NOTICE OF PREPARATION

TO: All
Federal, State, and
Local, Responsible
Cooperating Agencies

From: Planning/Building Department
939 Main Street
El Centro, CA 92243
(760) 339-4236/FAX 353-8338

SUBJECT: Notice of Preparation of a Draft Environmental Impact Report/ Statement for the Mesquite Mine Expansion by Newmont Gold Company/6502 East Highway 78, Brawley, California 92227

This is to inform you that the Imperial County Planning/Building Department in cooperation with the Bureau of Land Management, El Centro Field Office, will be the lead agency and will prepare an EIR/EIS for the project described below. Your participation as a responsible/cooperating agency is requested in the preparation and review of this document. We will need the name of a contact person in your agency.

We need to know the applicable permit and environmental review requirements of your agency and the scope and content of the environmental information which is relevant to your agency's statutory responsibilities in connection with the proposed project. Your agency will need to use the EIR/EIS prepared by the Planning/Building Department when considering your permit or other approval for the project.

The project action is to expand the existing Mesquite Mine, located approximately 35 miles east of Brawley, in eastern Imperial County, California. The site is bordered on the north by the U.S. "Chocolate Mountains Aerial Gunnery Range" and on the east and south by State Highway 78. The Mesquite Mine began mining operations in late 1985 and has been in continuous operation to date. A summary project description, map location of project, and probable environmental impacts of the project are attached hereto.

Alternatives to be studied will include the "no project" alternative as appropriate to minimize environmental effects of the project.

planning@icoe.k12.ca.us

Three public scoping meetings will be noticed in local newspapers to solicit citizen information and participation in the proposed project. On January 26, 1998, the first scheduled scoping meeting will be held in Yuma, Arizona, at 7:00 p.m., the second meeting will be held in El Centro, California, at 7:00 p.m. on January 28th, and the third meeting to be held at 7:00 p.m. in San Diego. There will be a formal public hearing at the conclusion of the environmental studies by the Imperial County Planning Commission and the County Board of Supervisors. Public notice will be given as to the date, location and time of the scoping meeting and scheduled public hearings. Other individual scoping meetings will be arranged with responsible/cooperating agencies and with special interest groups upon request.

Due to the limits imposed by State law, your response must be sent at the earliest possible date but not later than 45 days after receipt of this notice.

Please send your response and direct any comments or questions regarding this project to Jurg Heuberger, AICP, Planning Director, Planning/Building Department, 939 Main Street, El Centro, California 92243, or by telephone at (760) 339-4236, extension 310, or via E-Mail to jurg@icoe.k12.ca.us. For comments regarding federal concerns, please contact Kevin Marty at Bureau of Land Management, Department of Interior, 1661 South 4th Street, El Centro, California 92243, telephone (760) 337-4400, FAX (760) 337-4490.

We look forward to working with all interested individuals, agencies and departments in the proposed expansion of the Mesquite Mine.

12-14-98
DATE

JURG HEUBERGER, AICP
Planning Director

12-14-98
DATE

THOMAS ZALE
Acting Field Manager

Attachments

JH/RC/MesqNOP

Reviewing Agencies Checklist — Supplementary Document N

KEY
S = Document sent by lead agency
X = Document sent by SCH
✓ = Suggested distribution

✓ Resources Agency
__ Boating & Waterways
__ Coastal Commission
__ Coastal Conservancy
__ Colorado River Board
__ Conservation
✓ Fish & Game
__ Forestry
✓ Office of Historic Preservation
__ Parks & Recreation
__ Reclamation
__ S.F. Bay Conservation & Development Commission
__ Water Resources (DWR)

Business, Transportation & Housing
__ Aeronautics
__ California Highway Patrol
__ CALTRANS District #_____
__ Department of Transportation Planning (headquarters)
__ Housing & Community Development

__ **Food & Agriculture**

Health & Welfare
__ Health Services _____

State & Consumer Services
__ General Services
__ OLA (Schools)

Cal-EPA
__ Air Resources Board
✓ APCD/AQMD
__ California Waste Management Board
__ SWRCB: Clean Water Grants
__ SWRCB: Delta Unit
__ SWRCB: Water Quality
__ SWRCB: Water Rights
✓ Regional WQCB # 7 (PALM DESERT)

Youth & Adult Corrections
__ Corrections

Independent Commissions & Offices
__ Energy Commission
✓ Native American Heritage Commission
__ Public Utilities Commission
__ Santa Monica Mountains Conservancy
✓ State Lands Commission
__ Tahoe Regional Planning Agency

S Other USF&WS (Carlsbad)
Army Corps of Engineers (SanDiego
Yuma Marine Air Station

Public Review Period (to be filled in by lead agency)

Starting Date 12/14/98 Ending Date 1/29/99

Signature _____ Date 12-14-98

Lead Agency (Complete if applicable):

Consulting Firm: _____
Address: _____
City/State/Zip: _____
Contact: _____
Phone: (____) _____

plicant: _____
Address: _____
City/State/Zip: _____
Phone: (____) _____

For SCH Use Only:

Date Received at SCH _____
Date Review Starts _____
Date to Agencies _____
Date to SCH _____
Clearance Date _____
Notes:

Revised October 1989



Imperial County General Plan

Imperial County Land Use Plan



REVISIONS	NO.	DESCRIPTION	BY	CHKD	APPROVED	DATE
						8/98

Newmont Gold Company

FIGURE 1.0
SITE LOCATION MAP

Mesquite Mine	BY: CL	DATE: 9/98	DWG NO.: FIG1.DWG
	SCALE 1"=1000' CONTOUR INTERVAL 30'		

2.0 PROJECT DESCRIPTION

2.1 Project Background

The Mesquite Mine is located in the Mesquite mining district, approximately 35 miles east of Brawley, in eastern Imperial County, California. The site is bordered on the north by the United States Navy's Chocolate Mountains Aerial Gunnery Range and on the east and south by California State Highway 78. The facility currently encompasses approximately 5,200 acres, of which approximately 3700 acres have been disturbed under existing permits and approvals.

The Mesquite Mine began mining operations in late 1985 following the BLM's preparation of the Environmental Assessment, and the State of California's approval of the Environmental Impact Report (U.S.D.I., BLM, St. Clair Research, EIR/EA, 1984.) Since that time, several expansions and modifications to operations have taken place. These are summarized within the Mesquite Mine Consolidated POO. Also summarized there are the operating conditions and stipulations for the Mesquite Mine. Previous approvals included the construction and operation of facilities and related land disturbance activities in all or parts of Sections 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 15, 16, 17, 18, 19, 20, 21, 28, and 33 in T13S, R19E and Sections 4, 28 and 33 in T14S, R19E.

2.2 Existing and Permitted Facilities

Facilities at Newmont's Mesquite facility (Map 1) currently consist of:

1. Three open pit mines (Big Chief, Rainbow and Vista)
2. Seven heap leach pads (Vista Pad , and Pads 1, 2, 3, 4, 5, and 6). All pads are served by a single drainage collection network and process solution ponds

3. Fifteen overburden/interburden storage areas and clay storage areas
4. Ancillary facilities, including administrative offices, warehouse, maintenance shops, crusher, overland conveyor, laboratory and gold plant
5. Haul roads and storm water diversion channels
6. Limited land disturbances associated with permitted exploration activities

Table 1: Existing Disturbance Acreage

Facility	Cumulative Allowable Disturbance	Existing Disturbance
Open Pit Mines		
Big Chief		350
Rainbow		77
Vista		335
Open Pit Mine Total	910	762
Heap Leach Pads		
Nos. 1, 2, 3, &4 (combined)		292
Pad 5		121
Pad 6		150
Vista Pad		82
Ponds and Leach Facility Roads		258
Heap Leach Pad Total	1,143	903
OISA (Includes Clay Stockpiles)	1,738	1,219
Ancillary Facilities**	1,159	771
TOTAL	4950	3055

Note:

* **Allowable under existing permits and approvals of the current Consolidated Plan of Operations.**

** **Includes Exploration Disturbance, haul roads , and storm water diversion channels.**

2.3 Threatened and/or Endangered Species

The Mesquite Mine submitted a Biological Assessment concerning the Desert Tortoise to the Bureau of Land Management (BLM) in November 1991. The BLM then requested formal consultation, pursuant to Section 7 of the Endangered Species Act, from the United States Fish and Wildlife Service (USFWS). The USFWS subsequently issued Biological Opinion 1-6-92-F-22 (USFWS, 1992a) for the Mesquite Mine on March 26, 1992 in response to the BLM request. That Opinion was later amended to incorporate changes in the Mine's operating plan. The Mesquite Mine is currently operating under approved conditions and mitigation measures specified in those amendments.

Additionally, on June 1, 1992, the USFWS issued BO 1-6-92-F-28 (USFWS, 1992b) pertaining to small mining and exploration operations disturbing less than ten acres in the California Desert Conservation Area. The Mesquite Mine is located in this area and some minor activities at and around the mine have been undertaken under this Opinion.

The most recent Biological Assessment was submitted to the Los Angeles District Office of the U.S. Army Corps of Engineers (ACOE) in November 1997. That Assessment pertained to the North Half Sections (of Sections 5&6, T13S, R19E) Exploration Program. The ACOE then requested formal consultation from the USFWS, the USFWS consequently issued Biological Opinion 1-6-98-F-39 (USFWS, 1998). The North Half Sections Exploration Program is currently operating under approved conditions and mitigation measures specified in the BO.

Under the mitigation measures of the Biological Opinions, pre-construction clearance must be performed for the Desert Tortoise two weeks prior to any

disturbance activity. Surveys and appropriate mitigation measures pursuant to the Biological Opinions are performed if any Desert Tortoise habitation is found. Compensation for the proposed disturbance presented in this POO amendment would be provided to the BLM by Newmont in the form of a land exchange. Pursuant to previous mitigation efforts, compensation acres through the land exchange for the proposed new disturbance are also proposed to be calculated at 1.5 times the disturbed acres of habitat.

3.0 EXPLORATION ACTIVITIES

An active program of exploratory drilling is currently underway in northern halves of Sections 5 & 6 of T13S, R19E. This permitted program consists of a series of 387 boreholes, of which 191 were completed at this date (November 23, 1998). This drilling program is currently scheduled to be completed in late 1999. Geologic and metallurgical evaluation of the drilling results is ongoing. The proposed expansion of the North Big Chief Open Pit Mine discussed in Section 4.0 of this Plan is based on current knowledge of that deposit.

4.0 PROPOSED PROJECT

4.1 Proposed Mining Schedule

Current ore reserves included in the Mesquite Consolidated POO would be depleted by the end of the year 2000. Construction on the proposed expansion is anticipated to begin early in the year 2000 or, more correctly, as soon as possible following completion and approval of the proposed action and other related permits. Timely approval of the proposed expansion would allow continuous operations, without process interruption, facility closure, or staff reductions. This

expansion could extend mine operations for approximately seven years (tentatively through the year 2006).

Mining rates will vary with time. These will range from approximately 50 million tons of material per year in years one through three (2000-2002). The rate will then be scaled back to approximately 25 million tons in years four to six (2003-2005). Approximately 9 million tons in the final year of mining operations (year seven or 2008). At no time will mining rates exceed the currently permitted 65 million tons per year. Table 2 indicates the total volumes of materials to be mined, by year, after receipt of the final project approvals.

Table 2: Proposed Mesquite Mine Material Movement Schedule

YEAR	ORE	OVERBURDEN/ INTERBURDEN	TOTAL
1- (2000)	2,626,000	47,825,000	50,451,000
2- (2001)	7,011,000	43,249,000	50,260,000
3- (2002)	10,302,000	39,324,000	49,626,000
4- (2003)	5,363,000	19,319,000	24,682,000
5- (2004)	14,758,000	10,757,000	25,515,000
6- (2005)	14,040,000	11,021,000	25,061,000
7- (2006)	3,886,000	4,886,000	8,772,000
TOTAL	57,986,000	176,381,000	234,367,000

4.2 Proposed Facilities

The proposed Consolidated POO amendment (shown on Maps 2A and 2B) consists of:

- Extensions of the Big Chief Open Pit Mine
- Extension of the Rainbow Open Pit Mine
- Expansion of Out-of-Pit and/or In-Pit Overburden/Interburden Storage Areas (OOISAs and/or IOISAs)
- Construction of additional heap leach facilities
- Construction of ancillary facilities such as access roads and storm water diversion channels

Disposition of subeconomic overburden/interburden via in-pit overburden/interburden storage areas (IOISAs) is the preferred option (See Section 4.2.3). Construction of new or expanded out-of-pit overburden/interburden storage areas (OOISAs) is also an option. Storm water diversion channels will be constructed to the north of the Big Chief and Rainbow Open Pit Mines. Existing drainages within the project site will also be modified to allow extension of the Big Chief Open Pit Mine to the south and southeast. A portion of the Vista Heap Leach Pad and some ancillary office and shop facilities will also be moved to accommodate these extensions.

4.2.1 Open Pits

4.2.1.1 East Rainbow Open Pit Mine Extension

The existing Rainbow Open Pit Mine would be extended to the southeast. The extension would allow access to approximately 23,000,000 tons of ore and would

occupy approximately 105 acres. Approximately 104,000,000 tons of overburden/interburden (O/I) from the extension would be produced. This material would be stored in an IOISA and/or an OOISA.

The maximum depth of the proposed pit is approximately 570 feet. The east wall of the proposed pit would have a designed inter-ramp slope angle of 43 degrees and would be set back approximately 350 feet from Highway 78 in order to provide adequate geotechnical stability. An engineered O/I buttress constructed at the toe of the eastern pit wall will provide additional pit wall stability adjacent to the highway corridor.

Additionally, a berm would be constructed on the eastern edge of the proposed extension to reduce visual impacts to Highway 78 traffic. The berm would be a minimum of 10 feet in height with 2:1 side slopes and would extend approximately 2,450 feet. The berm will also serve to isolate the storm water diversion channel from the East Rainbow Open Pit Mine.

4.2.1.2 Big Chief Open Pit Mine – North Extension

An extension of the existing Big Chief Open Pit Mine toward the north would extend into the northern half of Section 5 of T13S, R19E. The proposed extension would allow access to approximately 11,000,000 tons of ore and would occupy approximately 46 acres.

Approximately 20,000,000 tons of O/I would be removed from the proposed extension. This material would be stored in an IOISA and/or an OOISA.

4.2.1.3 Big Chief Open Pit Mine – South Extension

An extension of the existing pit is proposed toward the south in Sections 5 and 8 of T13S, R19E. The proposed extension would allow access to approximately 7,000,000 tons of ore and would occupy approximately 55 acres.

Approximately 24,000,000 tons of O/I would be removed from the proposed extension. This material would be stored in an IOISA and/or an OOISA.

4.2.1.4 Big Chief Open Pit Mine – Southeast Extension

The existing Big Chief Open Pit Mine would be extended toward the intersection of Sections 4, 5, 8 and 9 of T13S, R19E. This extension would allow access to approximately 18,000,000 tons of ore and would occupy approximately 97 acres.

Approximately 58,000,000 tons of O/I would be mined from this extension. This material would be stored in an IOISA and/or an OOISA.

4.2.2 Heap Leach Facilities

4.2.2.1 Heap Leach Pad 6, Phase II

This facility would be expanded to the east, under existing permits, to accommodate approximately 58,000,000 tons of ore and would add 2,250,000 square feet of lined area. Final pad height would not exceed 300 feet, and would be constructed in lifts of approximately 25 feet. The new phase of the leach pad would be connected to the existing Pad 6 drainage and solution collection system. No additional pond or major piping modifications are required to accommodate the new facility. Permit-mandated levels of pond freeboard and stormwater collection

capacity would be maintained. Total new disturbance would be approximately 68 acres.

4.2.2.2 Vista Heap Leach Pad – Rinsing, Closure And Partial Removal

Spent ore covering an area of approximately 30 acres must be rehandled to accommodate mining of the Big Chief Open Pit Mine South and Southeast Extensions. These extensions would excavate previously disturbed lands through which the existing storm water drainage channel passes in the northeast corner of Section 8, T13S, R19E. Mining through that region would necessitate the construction of the proposed Vista Diversion Channel (Section 4.2.5.3). That construction would require partial removal of both the Vista Heap Leach Facility and a portion of North Vista OOISA.

Approximately 6,000,000 tons of spent leach ore is currently under the final phase of leaching on the Vista Pad. This activity and subsequent rinsing has been initiated in preparation for closure of that facility. Following completion of rinsing, formal closure and State of California approvals, the rinsed ore would either be removed and stored in an IOISA in the existing Vista Open Pit Mine, or would be relocated to a lined heap leach facility (Pad 6). The truncated northern limit of the Vista Heap Leach facility would then be rebuilt to provide a containment berm and solution channel similar to the existing facility.

4.2.3 Overburden/Interburden Storage Areas -

The proposed mine extension would generate approximately 169,000,000 tons of Overburden/Interburden. These materials are metallurgically classified as oxidized, do not contain significant quantities of sulfide sulfur, and are normally considered neutral or acid neutralizing. Additionally, these materials have been

evaluated for leachability via the US Environmental Protection Agency's Synthetic Precipitation and Leaching Procedure (SPLP). Based on the test results, these materials do not have significant capacity to liberate, mobilize or release metals or other contaminants to surface or ground water resources (Newmont Gold Company, 1998). These benign characteristics combined with the limited regional precipitation and a very deep regional bedrock aquifer support the conclusion that overburden/interburden (O/I) storage does not represent a significant potential environmental impact to water resources.

Final disposition of 169,000,000 tons of O/I materials from the various proposed pit extensions is under evaluation. Two alternatives are being considered:

1) Storage of O/I on new and/or expanded Out-of-pit Overburden/Interburden Storage Areas
2) Storage of O/I within mined-out open pits as In-pit Overburden/Interburden Storage Areas

Map 2A and Figures 2 and 3 show plans and cross-sections through the open pits and proposed IOISAs. Map 2B and Figures 4 and 5 show plans and cross-sections through the alternative proposal for expanded and/or new OOISAs. Construction of IOISAs would minimize disturbance of additional areas. Table 3 contrasts the land disturbance necessary for the alternative to the in-pit OISA option.

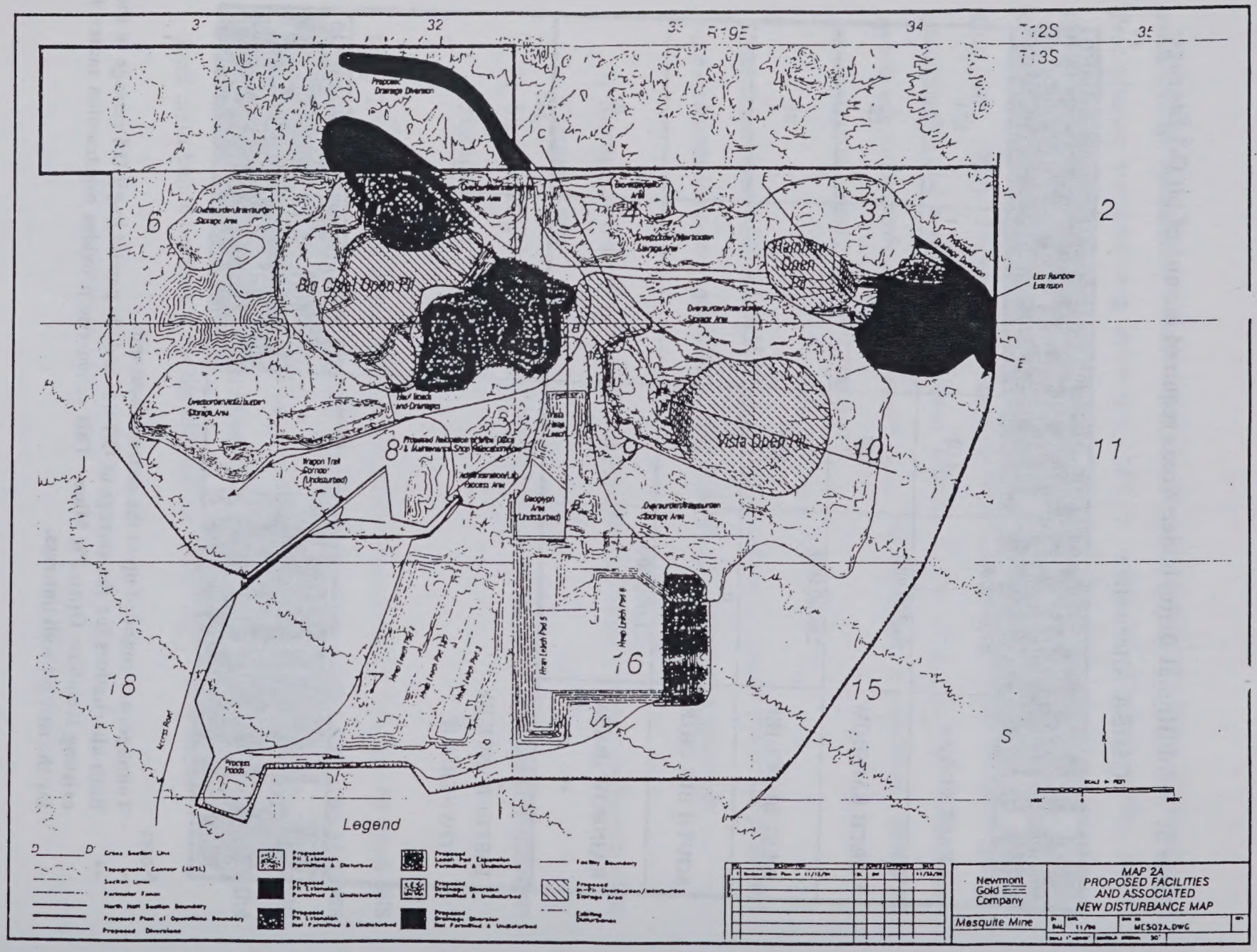
Table 3: Additional Disturbance Areas required for out-of-pit O/I Storage-OOISA Alternative

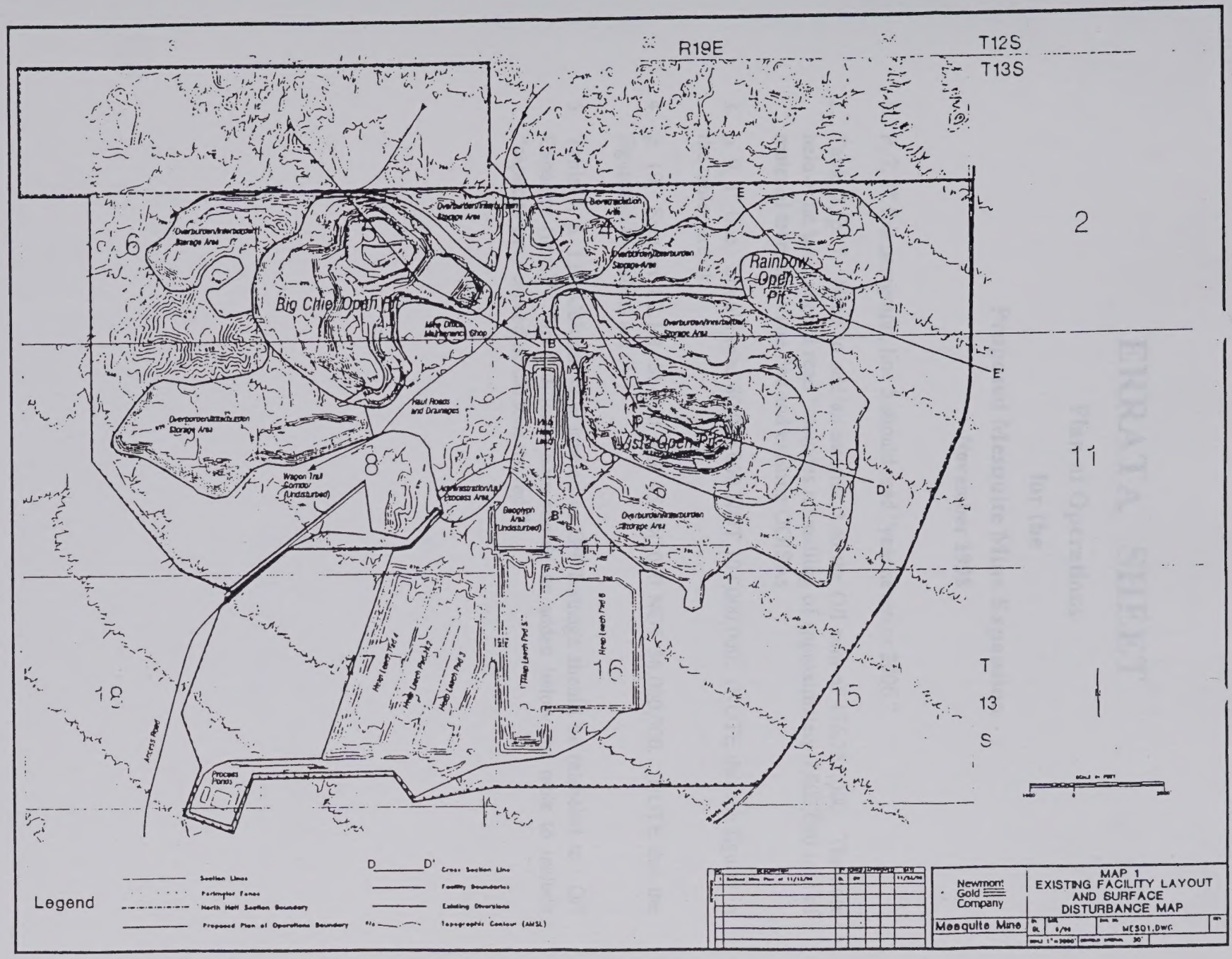
PROPOSED OOISA	O/I TONNAGE	HEIGHT (FT)	PRIVATE LAND DISTURBANCE	FEDERAL LAND DISTURBANCE
EAST VISTA	87,000,000	150	0	124
NORTH RAINBOW	56,000,000	150	0	22
WEST BIG CHIEF	23,000,000	150	0	21
SOUTH BIG CHIEF	0	0	0	0
RAINBOW (IOISA) **	21,000,000	0	0	0
TOTAL DISTURBANCE BY OWNERSHIP			0	167
TOTAL	187,000,000 tons		TOTAL DISTURBANCE (ACRES)	167 acres

Note:

* Tonnages are rounded up to the nearest thousand.

** Both alternatives for the storage of O/I will include partial in-pit O/I storage in the existing Rainbow Open Pit Mine. This action also provides construction material for the east pit wall buttress.


R19E
T12S
T13S
Proposed Drainage Diversion
Big Canal Open Pit
Rainbow Open Pit
Vista Open Pit
Proposed Relocation of Mine Office & Maintenance Shop
Wagon Trail Corridor (Undisturbed)
Sycamore Area (Undisturbed)
Process Ponds
Legend
Newmont Gold Company
Mesquite Mine
MAP 2A
PROPOSED FACILITIES AND ASSOCIATED NEW DISTURBANCE MAP
MESQ2A.DWG


R19E
T12S
T13S
Big Chief Open Pit
Rainbow Open Pit
Vista Open Pit
Overburden/Interburden Storage Area
Haul Roads and Drainages
Wagon Trail Corridor (Undisturbed)
Geophysics Area (Undisturbed)
Process Ponds
Access Road
Legend
Section Lines
Perimeter Fence
North Half Section Boundary
Proposed Plan of Operations Boundary
Cross Section Line
Facility Boundaries
Existing Diversions
Topographic Contour (AMSL)
Newmont Gold Company
Mesquite Mine
MAP 1
EXISTING FACILITY LAYOUT AND SURFACE DISTURBANCE MAP
MES01.DWG



ERRATA SHEET

Plan of Operations
for the
Proposed Mesquite Mine Expansion
November 1998

1. P. 7, 1st full paragraph, line 5 should read "year seven or 2006."

2. Table 2, p. 7. Need to add an asterisk * to the O/I sum of 176,381,000. The note below the table should read "includes rehandling of approximately 7,000,000 tons of material from the Vista Pad and existing OOISAs.

3. p. 9, 1st line. Should read 80,000,000 NOT 104,000,000. (NOTE that the figures in the tables are ok.)

4. p. 10, Section 4.2.1.4, Should read 45,000,000 NOT 58,000,000. (NOTE that the figures in the tables are ok.)

5. Table 3, p. 13. Column now labeled as O/I Tonnage should be relabeled to : O/I Capacity (tons)* (an additional note should be added below the table to include "capacity may exceed actual tons moved."

NOP

STATE OF CALIFORNIA

Governor's Office of Planning and Research

1400 TENTH STREET SACRAMENTO, CALIFORNIA 95812-3044

Pete Wilson
GOVERNOR

Paul F. Miner
DIRECTOR

December 17, 1998

To: Reviewing Agencies

Re: Mesquite Mine Expansion
SCH# 98121054

Attached for your comment is the Notice of Preparation for the Mesquite Mine Expansion draft Environmental Impact Report (EIR).

Responsible agencies must transmit their concerns and comments on the scope and content of the NOP, focusing on specific information related to their own statutory responsibility, within 30 days of receipt of this notice. We encourage commenting agencies to respond to this notice and express their concerns early in the environmental review process.

Please direct your comments to:

Richard Cabanilla
County of Imperial, Planning and Building Department
939 Main Street, Ste B-1
El Centro, CA 92243

with a copy to the Office of Planning and Research. Please refer to the SCH number noted above in all correspondence concerning this project.

If you have any questions about the review process, call the State Clearinghouse at (916) 445-0613.

Sincerely,

Antero A. Rivasplata

Antero A. Rivasplata
Chief, State Clearinghouse

Attachments
cc: Lead Agency

RECEIVED
JAN 27 1999
IMPERIAL COUNTY
PLANNING & BUILDING

NOP Distribution List

SCH# 98121054

S = sent by lead agency
X = sent by SCH

Resources Agency

- Nadell Gayou, *Resources Agency*, 1020 Ninth Street, Third Floor, Sacramento, CA 95814, 916/327-1722 Fax 916/327-1648
- Susie Betzler, *Dept. of Boating & Waterways*, 1629 S Street, Sacramento, CA 95814, 916/445-6281 916/327-7250
- Elizabeth A. Pochs, *California Coastal Commission*, 45 Fremont Street, Suite 1970, San Francisco, CA 94105-2219, 415/904-5200 Fax 415/904-5400
- William Ahern, *State Coastal Conservancy*, 1330 Broadway, Suite 1100, Oakland, CA 94612, 510/286-1015 Fax 510/286-0470
- Karen Yowell, *Dept. of Conservation*, 801 K Street, MS-24-02, Sacramento, CA 95814, 916/445-8733 Fax 916/324-0948
- Allen Robertson, *Dept. of Forestry & Fire Protection*, 1416 Ninth Street, Room 1516-24, Sacramento, CA 95814, 916/657-0300 Fax 916/653-8957
- Hans Kreutzberg, *Office of Historic Preservation*, P.O. Box 942896, Sacramento, CA 94296-0001, 916/653-9107 Fax 916/653-9824
- Beth Walls, *Resource Management Board, Dept. of Parks and Recreation*, P.O. Box 942896, Sacramento, CA 94296-0001, 916/653-6725 Fax 916/657-3355
- Environmental Review, *Reclamation Board*, 1416 Ninth Street, Room 1623, Sacramento, CA 95814, 916/327-1531 Fax 916/327-1600
- Steve McAdam, *S.F. Bay Conservation & Dev't. Comm.*, 30 Van Ness Avenue, Room 2011, San Francisco, CA 94102, 415/557-3686 Fax 415/557-3767
- Nadell Gayou, *Department of Water Resources*, 1020 Ninth Sueet, Third Floor, Sacramento, CA 95814, 916/327-1722, Fax 916/327-1648

Health & Welfare

- Robert Hultquist, *Dept. of Health/Drinking Water*, 601 N. 7th Sueet, PO Box 942732, Sacramento, CA 94234-7320, 916/323-6111 Fax 916/327-6992

Fish and Game - Regional Offices

- Richard L. Elliott (Region 1), Department of Fish and Game, 601 Locust, Redding, CA 96001, 530/225-2363 Fax 530/225-2381
- Binky Curtis (Region 2), Department of Fish & Game, 1701 Nimbus Road, Suite A, Rancho Cordova, CA 95670, 916/358-2898 Fax 916/358-2912
- Brian Hunter (Region 3), Department of Fish and Game, P.O. Box 47, Yountville, CA 94599, 707/944-5518 Fax 707/944-5563
- George Nokes (Region 4), Department of Fish and Game, 1234 East Shaw Avenue, Fresno, CA 93710, 209/445-6152 Fax 209/445-6607
- Sandy Peterson (Region 5), Department of Fish and Game, Habitat Conservation Program, 4949 Viewridge Avenue, San Diego, CA 92123, 619/467-4234
- Cheryl Avants (Region 6), Department of Fish and Game, Habitat Conservation Program, 330 Golden Shore, Suite 50, Long Beach, CA 90802, 562/590-5159
- Alan Pickard (Inyo & Mono), Department of Fish and Game, Habitat Conservation Program, 407 West Line Street, Room 8, Bishop, CA 93514, 760/872-1129

Independent Commissions/Agencies

- Greg Newhouse, *California Energy Commission*, 1516 Ninth Street, MS-15, Sacramento, CA 95814, 916/654-5000 Fax 916/654-4162
- Debbie Treadway, *Native American Heritage Comm.*, 915 Capitol Mall, Room 364, Sacramento, CA 95814, 916/653-4082 Fax 916/657-5390
- Andrew Barnsdale, *Public Utilities Commission*, 505 Van Ness Avenue, San Francisco, CA 94102, 415/703-3231 Fax 415/703-1184
- Betty Silva, *State Lands Commission*, 100 Howe Avenue, Suite 100 S, Sacramento, CA 95826, 916/574-1872 Fax 916/574-1885
- Gerald R. Zimmerman, *Colorado River Board*, 770 Fairmont Avenue, Suite 100, Glendale, CA 91203-1035, 818/543-4676 Fax 818/543-543-4685
- Tahoe Regional Planning, *Environmental Review*, P.O. Box 1038, Tahoe City, NV 96145

- John Rowden, Manager, *Office of Emergency Services*, 11030 White Rock Road, Ste.110, Rancho Cordova, CA 95670, 916/464-1014
- Debby Eddy, *Delta Protection Commission*, P.O. Box 530, Walnut Grove, CA 95690, 916/776-2290 FAX 776-2293

Department of Transportation
District Contacts

- Martin Urkofsky, *Caltrans, District 1*, 1656 Union Street (P.O. Box 3700), Eureka, CA 95501, 707/445-6412 Fax 707/445-5869
- Vicki Roe, *Local Development Review, Caltrans, District 2*, P.O. Box 496073, Redding, CA 96049-6073, 530/225-3089 Fax 530/225-3271
- Jeff Pulverman, *Caltrans, District 3*, P.O. Box 94874, Sacramento, CA 94274-0001, 916/327-3859 Fax 916/323-7669
- Phillip Badal, *Caltrans, District 4*, P.O. Box 23660, Oakland, CA 94623-0660, 510/286-5378 Fax 510/286-5513
- Lawrence Newland, *Caltrans, District 5*, 50 Higuera Street, San Luis Obispo, CA 93401, 805/549-3683 Fax 805/549-3077
- Marc Birnbaum, *Caltrans, District 6*, P.O. Box 12616, Fresno, CA 93778-2616, 209/448-4020 Fax 209/488-4101
- Stephen J. Buswell, *Caltrans, District 7*, 120 South Spring Street, Los Angeles, CA 90012, 213/897-4429 Fax 213/897-9210
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- Ed Fuentes, *Caltrans, District 10*, P.O. Box 2048, Stockton, CA 95201, 209/948-7783 Fax 209/948-7906
- Lou Salazar, *Caltrans, District 11*, P.O. Box 85406, MS 5-5, 2829 Juan Street, San Diego, CA 92186-5406, 619/688-3140 Fax 619/688-2511

- Aileen Kennedy, *Caltrans, District 12*, 2501 Pullman St., Santa Ana, CA 92705, 714/724-2239 Fax 714/724-2592

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- Ken Baxter, *California Highway Patrol*, Office of Special Projects, Planning and Analysis Division, 2555 1st Ave., Sacramento, CA 95818, 916/657-7222 Fax 916/452-3151
- Ron Helgeson, *Caltrans - Planning*, P.O. Box 942874, Sacramento, CA 94274-0001, 916/653-9966 Fax 916/653-0001

State and Consumer Services

- Robert Sleppy, *Dept. of General Services*, 400 R Street, Suite 5100, Sacramento, CA 95814, 916/324-0214 Fax 916/322-3987

California Environmental Protection Agency

- Mike Tollstrup, *Air Resources Board*, 2020 L Street, Sacramento, CA 95815, 916/322-8473 Fax 916/322-5982
- Jeanie Blakeslee, *Calif. Waste Management Board*, 8800 Cal Center Drive, Sacramento, CA 95826, 916/255-4164 Fax 916/255-4216
- Wayne Hubbard, *State Water Resources Control Board, Division of Clean Water Programs*, P.O. Box 944212, Sacramento, CA 94244-2120, 916/227-4408 Fax 916/227-4349
- Phil Zentner, *State Water Resources Control Board, Division of Water Quality*, P.O. Box 944213, Sacramento, CA 94244-2130, 916/657-0912 Fax 916/657-2388
- Mike Falkenstein, *State Water Resources Control Board, Division of Water Rights*, 901 P Street, 3rd Floor, Sacramento, CA 95814, 916/657-1377 Fax 916/657-1485
- Dept. of Toxic Substances Control, *CEQA Tracking Center*, 400 P Street, Fourth Floor, P.O. Box 806, Sacramento, CA 95812-0806, 916/324-3119 Fax 916/324-1788

Regional Water Quality Control Board

- NORTH COAST REGION (1), 5550 Skyline Blvd., Suite A, Santa Rosa, CA 95403, 707/576-2220 Fax 707/523-0135
- SAN FRANCISCO BAY REGION (2), Environmental Document Coordinator, 1515 Clay Street, Suite 1400, Oakland, CA 94612, 510/622-2300 Fax 510/622-2460
- CENTRAL COAST REGION (3), 81 Higuera Street, Suite 200, San Luis Obispo, CA 93401-5427, 805/549-3147 Fax 805/543-0397
- LOS ANGELES REGION (4), CEQA Coordinator, 320 West 4th Street, Suite 254, Los Angeles, CA 90017, 213/266-7500 Fax 213/266-7600
- CENTRAL VALLEY REGION (5), 3443 Routier Road, Suite A, Sacramento, CA 95827-3098, 916/255-3000 Fax 916/255-3015
  - Fresno Branch Office, 3614 East Ashlan Avenue, Fresno, CA 93726, 209/445-5116 Fax 209/445-5910
  - Redding Branch Office, 415 Knollcrest Drive, Redding, CA 96002, 916/224-4845 Fax 916/224-4857
- LAHONTAN REGION (6), 2501 Lake Tahoe Boulevard, South Lake Tahoe, CA 96150, 530/542-5400 Fax 530/544-2271
  - Victorville Branch Office, 15428 Civic Drive, Suite 100, Victorville, CA 92392-2359, 760/241-6583 Fax 760/241-7308
- COLORADO RIVER BASIN REGION (7), 73720 Fred Waring Drive, #100, Palm Desert, CA 92260-2564, 760/782-7495 Fax 760/341-6820
- SANTA ANA REGION (8), 3737 Main Street, Suite 500, Riverside, CA 92501-3339, 909/782-4130 Fax 909/781-6288
- SAN DIEGO REGION (9), 9771 Clairemont Mesa Blvd., Suite B, San Diego, CA 92124-1324, 619/467-2952 Fax 619/571-6972

- OTHER: _____
- OTHER: _____

02/26/1999 15:04 9163232488

UNITED STATES MARINE CORPS
MARINE CORPS AIR STATION
BOX 99100
YUMA, ARIZONA 85369-9100

IN REPLY REFER TO:
11000
3AQ/mesqpoc
25 Jan 99

Mr. Jurg Heuberger
Planning Director
Imperial County Planning Dept.
939 Main St.
El Centro, CA 92243-2856

Dear Mr. Heuberger:

We received your letter of December 14, 1998 requesting participation as a responsible/ cooperating agency in preparation of the EIS/EIR for the Mesquite Mine Expansion by Newmont Gold Company.

1. Mr. Ron Pearce from the Range Department at the Marine Corps Air Station will be the point of contact for this project. He may be reached at (520) 341-3401. A copy of this project has been sent to him for review.

Thank you for giving this Command the opportunity to comment. If you have any questions, please feel free to contact me at (520)341-2103/2272.

Sincerely,

T. A. MANFREDI
Community Planner
By direction of the
Commanding Officer

Copy to:
Mr. Ron Pearce, Range Dept
Environmental Dept

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(2)

16 comment total

United States Department of the Interior
Fish and Wildlife Service
Ecological Services
Carlsbad Fish and Wildlife Office
2730 Loker Avenue, West
Carlsbad, CA 92008

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Mr. Jurg Heuberger
AICP, Planning Director
Planning/Building Department
939 Main Street
El Centro, California 92243

Re: Notice of Preparation of a Draft Environmental Impact Report/Statement for the Mesquite Mine Expansion by Newmont Gold Company, City of Brawley, Imperial County, California (1-6-99-I-24)

Dear Mr. Heuberger:

The U.S. Fish and Wildlife Service (Service) has reviewed the referenced Notice of Preparation (NOP), received December 16, 1998, concerning the proposed expansion of the existing Mesquite Mine. Currently, the 5,200 acre operation, located in Imperial County, California, maintains sufficient ore reserves to continue excavation until the year 2000 (East of Acolita, Ninemile Wash, and Clyde USGS 7.5' Quadrangles, T13S, R19E, Sections 2-11, 15-21, 28, and 33, and T14S, R19E, Sections 4, 28, and 33). With the planned development, however, the mine's lifetime could be extended until approximately 2006. Overall, the proposed action would involve enlarging the existing Big Chief and Rainbow pits, creating new overburden/interburden storage areas, and building additional heap leach/ancillary facilities. Associated surface disturbance to the surrounding Sonoran creosote bush scrub and desert dry wash woodland (or microphyllous woodland) areas, has been estimated at no greater than 472 acres.

The primary concern and mandate of the Service is the protection of public fish/wildlife resources and the species' associated habitats. Our mandates further require that we provide comments on any public notice issued for a Federal permit or license affecting the nation's waters (e.g., Clean Water Act, Section 404 and Rivers and Harbors Act of 1899, Section 10). The Service is also responsible for administering the Endangered Species Act of 1973, as amended (Act). Section 7 of the Act requires Federal agencies to consult with the Service should it be determined that a proposed action is likely to adversely affect listed species or critical habitat. Section 9 of the Act prohibits the "take" (i.e., harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct) of federally listed wildlife species. Harm (i.e., "take") is further defined to include significant habitat modification or degradation that actually kills or injures a listed species by significantly impairing essential behavior patterns, including breeding, feeding, or sheltering. Incidental take can only be permitted pursuant to the provisions in sections 4, 7, and 10(a) of the Act.

The Service offers the following information and recommendations to assist in planning for the conservation of sensitive wildlife species and habitat within the project area and furthering compliance with pertinent Federal statutes. To facilitate the evaluation of the proposed action for fish and wildlife conservation, the Service requests that the Draft Environmental Impact Report/Statement address these topics:

1. 1. A discussion of the need/purpose for the project, including each of the proposed alternatives.

2. 2. A complete description of the planned action, including all practicable alternatives that could reduce the overall impacts to locally sensitive wildlife, plants, and habitats (e.g., minimizing temporal/permanent loss of system function/structure through pit backfilling). Additionally, 3. provide an outline of the mine's consultation history with an accurate summary of previously approved activities (e.g., actual extent of exploratory drilling [385 holes]).

3. 4. A thorough narrative (accompanied with maps/tables and estimated acreages) on the different vegetation types (e.g., Sonoran creosote bush scrub, desert dry wash woodland [microphyllous woodland]) that could be potentially affected by the Mesquite Mine Expansion.

4. 5. A description of the biological resources associated with each habitat type. Discussions should include both qualitative and quantitative assessments of resources on the project site.

5. 6. An inventory of the federally listed/proposed/candidate species, state listed/candidate species, and locally sensitive species, including narrow endemics, occurring within and adjacent to the mine area. 7. Detailed discussions of the wildlife/plants, accompanied with information on local status/distribution, should be contained in the report.

6. 8. An assessment of the direct, indirect, and cumulative project impacts to wildlife/plant species and their associated habitat. All facets of the planned action (e.g., pit expansion, storage area creation, facilities construction, water diversion) should be included in the analysis. Furthermore, 9. provide a table itemizing all surface disturbance (i.e., acreages) associated with the mine expansion that has either received permit approval (with accompanying compensation) or will require future mitigation.

7. 10. Specific measures to fully offset mine-related impacts, including proposals to compensate for the cumulative effects of direct and indirect habitat loss, degradation, or modification. Adverse project effects can be mitigated through preservation or habitat restoration/revegetation. A restoration/revegetation program should direct efforts toward the reestablishment of a self-sustaining (i.e.,

pre-project) ecosystem. Former habitat structure/function can be promoted through the use of soil preparation techniques (e.g., recontouring, pitting), appropriate planting strategies (e.g., local native seed source use, outplantings, broadcasting, plant salvaging, fertilizer exclusion, minimizing/avoiding exotic seed collection, invasive plant removal, timing) and subsequent monitoring efforts (e.g., established/suitable success criteria, contingency plans). Overall, the preparation, inspection, and evaluation of components within the revegetation/restoration program should be conducted by a qualified plant biologist/ecologist with specific work experience in recovery of the affected system.

8. 11. An analysis of project activities on the hydrology of all ephemeral desert washes (e.g., microphyllous woodland) within the action's sphere of influence.

9. 12. Identification of methods to prevent soil erosion and siltation of habitats off-site or downstream of the project site; including erosion control techniques employed during/after construction, along with quantitative monitoring of direct and indirect effects.

10. 13. An Army Corps of Engineers' evaluation for Waters of the United States within the project area. Potential dredging/filling of jurisdictional waters may require issuance of a 404 permit prior to the onset of proposed surface disturbing activities.

11. 14. Identification of methods to prevent the discharge and disposal of toxic/caustic substances (including oil and gasoline) on the proposed site.

12. 15. A thorough assessment of potential noise and light impacts on wildlife and 16. measures to mitigate any adverse effects resulting from increased levels of noise and light.

The Service appreciates the opportunity to comment on the proposed Mesquite Mine Expansion. Any questions or concerns pertaining to this correspondence can be directed to Debbie MacAller of my staff at (760) 431-9440.

Sincerely,

Sheryl L. Barrett

Sheryl L. Barrett
Assistant Field Supervisor

cc: U.S. Bureau of Land Management, El Centro, CA (Attn: Kevin Marty)

STATE OF CALIFORNIA – THE RESOURCES AGENCY

PETE WILSON, Governor

DEPARTMENT OF CONSERVATION
801 K Street, MS 09-06
Sacramento, CA 95814
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February 2, 1999

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Richard Cabanilla
Imperial County Planning/Building Department
939 Main Street
El Centro, CA 92243

Dear Mr. Cabanilla:

Notice of Preparation and Reclamation Plan for the Mesquite Mine Expansion
Draft Envirnonmental Impact Report (EIR) SCH #98121054

The Department of Conservation's Office of Mine Reclamation (OMR) has reviewed the Notice of Preparation, Plan of Operations, and Reclamation Plan for the Mesquite Mine Expansion Draft Environmental Impact Report (EIR) SCH #98121054. The project is an exploration program on lands adjacent to the Mesquite Mine, located approximately 40 miles northeast of Brawley off State Highway 78. A site visit was conducted by OMR staff on December 9, 1997. The following comments prepared by Karen Wiese and Catherine Gaggini are offered to assist in your review of this project.

The Surface Mining and Reclamation Act of 1975 (SMARA) (Public Resources Code Section 2710 et seq.) and the State Mining and Geology Board regulations for surface mining and reclamation practice (California Code of Regulations (CCR) Title 14, Chapter 8, Article 1, Section 3500 et seq., Article 9 Section 3700 et seq.)(copies enclosed) require that specific items be addressed or included in reclamation plans. The following items were not adequately addressed in the document submitted; we recommend that the reclamation plan be supplemented to fully address these items.

End Land Use

(Refer to SMARA Section 2772(g),(h), CCR Sections 3704(e), 3706(a), 3707 (a),(c), 3708

1. I. SMARA Section 2772(c)(7) requires that the reclamation plan include a description of the proposed use or potential uses of the mined lands after reclamation. As discussed during the site visit, an end use, such as open space must be designated.

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2. 2. The reclamation plan should provide a discussion on what usable condition the open pits will serve upon termination of mining. If the pits are not backfilled, the reclamation plan should explain how the open pits will be reclaimed and readily adaptable for an alternate land use. Reclamation is defined in SMARA Section 2733 as the combined process of land treatment that minimizes water degradation, air pollution, damage to aquatic life or wildlife habitat, flooding, erosion, and other adverse effects from surface mining operations, including adverse effects incidental to underground mines, so that **mined lands are reclaimed to a usable condition which is readily adaptable for alternate land uses and create no danger to public health or safety**.

3. 3. SMARA Section 2772(c)(8) requires a description of the manner in which reclamation, adequate for the proposed use or potential uses will be accomplished. The reclamation plan does not provide sufficient information regarding the reclamation of each of the various vegetation types. For example, little information is provided regarding the wash habitat reclamation or proposed drainage ditch diversion. We recognize that it may be necessary to amend the revegetation mix or treatments after analysis of test plot data. Nevertheless, the revegetation plan should describe the range of treatments and species to be utilized for reclamation with the understanding that the treatments and species may change based on test plot results.

Environmental Setting and Protection of Fish and Wildlife Habitat

(Refer to CCR Sections 3502(b)(1), 3503(c), 3703 (a),(b),(c), 3704(g), 3705(a), 3706(a),(f),(g), 3710(a),(b),(c),(d), 3713(b)

4. 4. CCR Section 3502 (b)(1) requires that the reclamation plan include a description of the environmental setting of the mine site. As discussed during the site visit, a survey of the biotic resources on the proposed site are necessary for the following three reasons: 1) to document baseline conditions, 2) to aid in development and evaluation of an appropriate revegetation plan, and 3) to evaluate purported mining and reclamation impacts on sensitive species and wildlife habitat.

5. Prior to site disturbance, a quantitative description of the biotic setting of the site will be necessary to adequately establish baseline conditions of the site. This quantitative evaluation should include percent cover or density, and diversity measurements for **each** of the vegetation types that will be re-created on the reclaimed landform. Such quantitative data can also be used to guide the design of an appropriate revegetation plan.

6. Also prior to any site disturbance, the lack of impacts to sensitive, rare, threatened, and endangered plants and animals should be verified. The

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revegetation of the site should be designed to minimize impacts to those species. Without the knowledge of which species occur on the site, the revegetation design cannot target those species.

5. 7. CCR Section 3703(a) requires that all sensitive species be conserved or mitigated. The California Department of Fish (DFG) and Game Natural Diversity Data Base lists the following species as being detected in the proposed project vicinity. If surveys detect any of these species in the project area, then formal consultation and appropriate mitigation should be developed with the agency having jurisdiction over the species; the US Fish and Wildlife Service and/or the DFG.

Le Conte's Thrasher *Toxostoma lecontei*	CDFG : Species of Special Concern
Nelson's Bighorn Sheep *Ovis canadensis nelsoni*	
Flat-Tailed Horned Lizard *Phrynosoma mcalli*	CDFG: Species of Special Concern
Munz's Cholla *Opuntia munzii*	Federal: Species of Concern CNPS: 1B
Fairyduster *Calliandra eriophylla*	CNPS: 2

6. 8 If needed, we recommend that a copy of the Streambed Alteration Agreement be appended to the reclamation plan [CCR 3710(d)].

Geotechnical Requirements

(Refer to CCR Sections 3502(b)(3),(b)(4), 3704 (a),(b),(d),(f))

7. 9 The reclamation plan should be supplemented with a site-specific slope stability analyses that evaluates the long-term stability of the proposed final pit slopes and waste rock disposal sites. The final mine slopes are only specified for the east wall of the East Rainbow Open Pit. The slope angle specified has an inter-ramp slope angle of 43 degrees (approximately 1:1 horizontal to vertical) with a pit depth of 570 feet. The existing mine slopes have exceeded the critical gradient for the material currently being mined. Several failures, some massive, have occurred in the walls of the existing pits at the mine site. The failures have occurred in similar slopes described for the East Rainbow Open Pit. The reclamation does not provide final slope angles for the Big Chief Open Pit Mine – South Extension, North Extension, and Southeast Extension.

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If the pits are to remain open, a slope stability analysis must be performed to demonstrate long term stability of the proposed final pit slopes, as required by CCR Section 3502(b)(3). Final cut slopes are required to have a minimum factor of safety approved for the end use and conform with surrounding topography (CCR Section 3704(f).)

8. 10 The reclamation plan should be augmented to specify final slope angles of 2:1 (horizontal to vertical) or shallower for the Overburden/Interburden Storage Areas. If the fill slopes are not regraded to 2:1, the reclamation plan must provide a site-specific stability analysis of the proposed angle-of-repose fill slopes that substantiates their long-term stability. In addition, the reclamation plan is required to provide site-specific data that demonstrates the angle-of-repose slopes can be revegetated. For example, vegetation test plots could be installed on existing angle of repose slopes this spring. Topsoil should be applied to the slopes, and seeded. A time schedule should be provided for installation and monitoring of test plot areas beginning at the earliest feasible tiime. If, after a specified amount of time, test plots show that revegetation can not adequately occur on the angle-of-repose fill slopes, changes should be made to the slope design to ensure revegetation success of the fill slopes. Section 3704(d) requires that the final reclamation fill slopes not exceed 2:1, except when allowed by site-specific engineering analysis, and can be revegetated. Engineering reports for the proposed slopes should be submitted to OMR for review and comment prior to approval of the reclamation plan.

Hydrology and Water Quality

(Refer to SMARA Sections 2772(h)(1),(h)(2), 2773(a), CCR Sections 3503(a)(3),(b)(1), (d), 3706(c),(d),(e),(f),(g), 3710 (b),(c), 3711(e), 3712)

9. 11 The reclamation plan should be supplemented with site-specific sediment and erosion control criteria for monitoring compliance with the reclamation plan as required by SMARA Section 2773(a), and CCR Sections 3503 and 3706. The reclamation plan states that diversion channels will be constructed to engineering specifications to pass the design storm events. However, the reclamation plan is void of design specifications and monitoring criteria for the proposed diversion channels. Therefore, it is not possible to evaluate the adequacy of the proposed drainage control. The engineering design and monitoring criteria should be provided to OMR for review and comment prior to approval of the reclamation plan.

Resoiling and Revegetation

(Refer to SMARA Section 2773(a), CCR Sections 3503(a)(1),(f),(g), 3704(c), 3705(a),(b),(c),(d),(e),(f),(g),(h),(i),(j),(k),(l),(m), 3707(b),(d), 3711(a),(b),(c),(d),(e))

10. CCR Section 3711 establishes **mandatory** standards for topsoil salvage, maintenance, and redistribution. The seeds, microbial organisms, and organic

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matter found in the upper six inches of growth media constitute a significant resource when used in reclamation. Successful revegetation of the site may not be possible without this resource. We recommend that the upper six inches of growth media be stockpiled and reapplied during reclamation. Phasing the operation would obviate the need for long-term soil storage. As discussed during the site visit, the reclamation plan does not discuss this requirement. We recommend that the reclamation plan be amended to address the five subsections set forth in this section [CCR 3711(a) – (e)].

11. 13 CCR Section 3705(g) requires that the revegetation efforts use native plant species. The reclamation plan states that "seeding will be of adapted native or naturalized plant species..." Table B-3 of the reclamation plan contains several species that are deleterious to the establishment of native plants. The following species are not native to the site and should not be seeded:

Bromus madritensis	Red brome
Shismus barbatus	Mediterranean grass
Brassica tournefortii	Mustard

14 In addition, the chart states that seeding rates are included. The seeding rates of these species have been **omitted** from Table B-3. These rates should be included for OMR review. The reclamation plan states that the "seed rate is sown by volume rather than by weight." Seed is sold and sown by **weight**, not volume. We suggest that the seed installation rate be expressed as pounds per acre.

15 The reclamation plan states that seeds from local plants will be collected from surface soils and plants. The OMR commends the collection of local seeds, but surface seed collection can be problematic. Seeds collected from the surface of the soil are likely to contain debris or invasive species, therefore, exact seeding rates cannot be ascertained. In addition, seeds that have been collected from the soil surface may contain insects that will eat the seeds if placed plastic bags. Proper seed storage is imperative for seed longevity. Please refer to the enclosed article on seed collecting.

12. 16 To mitigate potential visual impacts and blend the waste piles with the surrounding terrain, varnished rock hand-sized or larger could be removed from the soil surface and stockpiled. During reclamation, these rocks can be replaced on the waste piles with the varnished side visible. Replacement of rock will also create microsites favorable to natural revegetation.

13. 17. CCR Section 3705(b) requires test plots to be conducted simultaneously with mining to determine the most appropriate planting procedures. The information

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gained from previously developed test plots should be contained in the reclamation plan. The reclamation plan discusses several revegetation techniques that may be employed. We recommend that specific test trials be designed to determine the most effective method(s) of site revegetation, based on microsite conditions. For example, the microsite conditions at the North Extension are different than those at the East Rainbow Extension. At a minimum, the tests should examine the effectiveness of seeding vs. container plantings, the effects of different types of mulches, the effects of fertilizer, if used, and the effects of irrigation. The most effective method(s) could then be incorporated into the reclamation plan, thereby, minimizing the possibility of poor revegetation. Test plots should be located in upland, angle of repose slopes, and wash habitats. We also recommend that revegetation treatments be delineated on a plan map.Any techniques that have not been tested, such as planting young ironwood and palo verde trees or seedlings should be tested prior to implementation.

14. 18 CCR Section 3705(j) states that if irrigation is used, it must be demonstrated that the vegetation has been self-sustaining without irrigation for a minimum of two years prior to release of the financial assurances. Success criteria must be developed for any containerized plants such as the ironwood or palo verde that will be irrigated to ensure that these species survive at least two years after irrigation has ceased.

15. 19 SMARA Section 2773(a) requires that a monitoring plan be developed that addresses topography, revegetation, and sediment and erosion control." Quantitative performance standards must be specified in the reclamation plan (see following comment). The monitoring plan should discuss frequency and duration of monitoring. For revegetation elements, monitoring should be conducted until performance standards are attained. The reclamation plan states that monitoring will continue for 5 years. Reclamation success in arid lands often exceeds the 5 year monitoring period. Monitoring should be conducted annually until performance standards are attained, with reports submitted to the lead agency and DOC.

16. 20 CCR Section 3705(m) requires that the reclamation plan include performance standards (success criteria) for each vegetation type that will be re-created that can be quantified by cover, density, species-richness, and a sample size that provides a minimum 80% confidence level. As discussed in the site visit, the success criteria provided in the reclamation plan do not adequately meet this requirement. We recommend that these criteria be redefined according to baseline data and submitted to OMR for review.

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Administrative Requirements
(Refer to SMARA Sections 2774(b), 2776, 2777, PRC Section 21151.7)

When the revised reclamation plan has been completed, please forward the document to OMR at 801 K Street, M.S. 09-06, Sacramento, CA 95814-3529. As we discussed during the site visit, all technical studies relevant to reclamation of the mine site should be referenced in and appended to the reclamation plan submitted to OMR for review and comment.

If you have any questions on these comments or require any assistance with other mine reclamation issues, please contact me at (916) 323-8565.

Sincerely,

James Pompy, Manager
Reclamation Unit

Enclosures

NATIVE SEED COLLECTION

For Wildland Revegetation

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KAREN WIESE, Plant Ecologist
Office of Mine Reclamation
California Department of Conservation

For thousands of years, seed collecting has been an integral part of all cultures throughout the world. Seeds were gathered for food, trade items, and currency, and wars were fought over the right to collect them (Photo 1). Seed collecting continues to be a worthwhile business as the need to provide site specific native plant seed for revegetation grows by legislative mandate and a worldwide movement to preserve biodiversity.

In 1994, the Federal Native Plant Conservation Memorandum of Understanding (MOU) was established by seven federal agencies to identify priority conservation needs for native plants and their habitats. The MOU states that native plant species are of aesthetic, ecological, educational, historical, recreational, and scientific value to the United States and our native plant heritage should be maintained by ensuring native plant species and communities are conserved on public lands, and promoted on private lands. In fact, the Bureau of Land Management and the U.S. Forest Service have specific requirements for the conservation and maintenance of native plants on mined lands.

In California, the Surface Mining and Reclamation Act (SMARA) establishes legislation that requires mined lands to be reclaimed to a usable condition. Under AB 3551 and AB 3903, revisions to SMARA require statewide standards for the reclamation of mined land, including California Code of Regulations Section 3705(g), which requires native plant species to be used for revegetation except under special circumstances. This article provides guidelines for the collection of seeds of native plants to be used in reclamation projects such as mined-land revegetation. It is an excerpt from the California Department of Conservation's book *Rehabilitation of Disturbed Lands in California*, scheduled for release in early 1997.

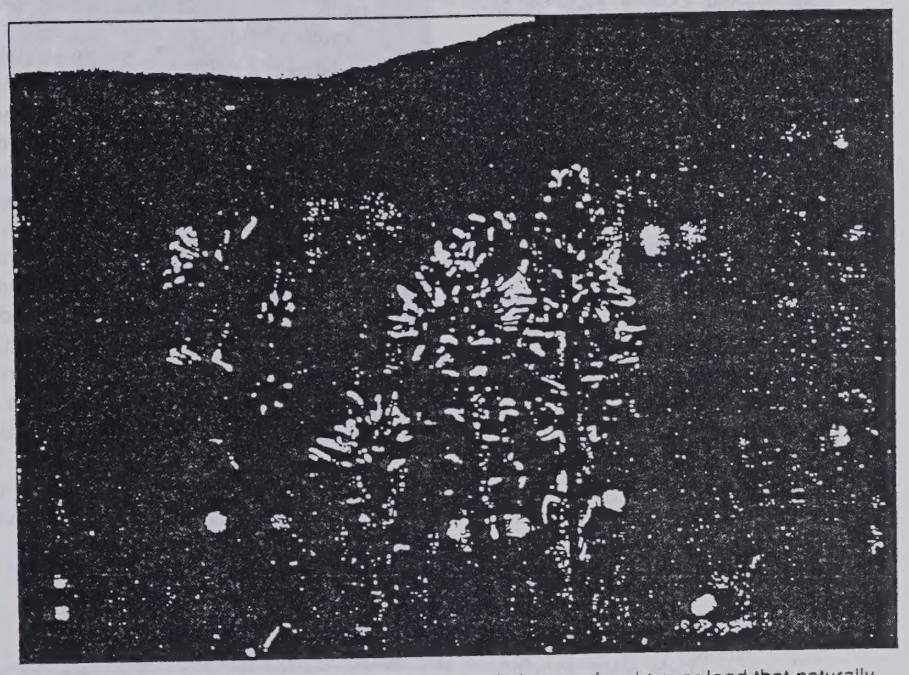


Photo 1. During the 1800s, Native Americans and pioneers fought over land that naturally produced native food staples. The bulbs of the camas lily, *Camassia quamash*, were particularly important to Native Americans but also enjoyed by the pioneers' livestock. *Photo by Karen Wiese.*

The goal of reclamation should be determined before any rehabilitation program begins. The end use of a site dictates what plant species should be chosen for revegetation. For example, if the end use of a site is a residential area, the goal of reclamation is erosion control until the site is developed. The plant species best-suited for short-term erosion control may not be native plant species. An inexpensive erosion control mix may be sufficient. However, native plants should be used when the goal of revegetation is creation of open space or wildlife habitat, or reclamation of the site to the pre-disturbance vegetation type. Native plants are those species that existed prior to the European influx in the 1700s. With reclamation of wildlife habitat or open space in mind, species that existed on the site before disturbance and those that have naturally revegetated previously disturbed sites have the best chance to survive. It is these species that have evolved genetically to be adapted to the site-specific conditions of the soil, slope, aspect, and climate. Because of their outstanding adaptability, these plants provide a better chance for successful reclamation and therefore subsequent cost savings. Botanical surveys conducted before disturbance, or surveys of nearby reference areas can assist the reclamationist in developing a palette of revegetation species.

SEED COLLECTION

Once certain plant species have been chosen for the revegetation project, the seed can be collected from the

site by mine personnel or a contract seed collector, or purchased from commercial sources. If seed is purchased from a commercial seed company, it is important to know the origin of the seed and obtain seed from the same geographic location as the project site.

Genetic Considerations

Many plant species comprise local **ecotypes*** narrowly adapted to local climate and **edaphic** conditions (Plummer and others, 1955). The plants with the best odds of survival on a site are those ecotypes growing on (or near) the site (Millar and Libby, 1989). Use of nonlocal plants for revegetation can result in the application of a poorly adapted ecotype, as well as the potential for genetic contamination. Interbreeding of nonlocal and wild local native stock can be adverse and permanent.

Source of Plant Material

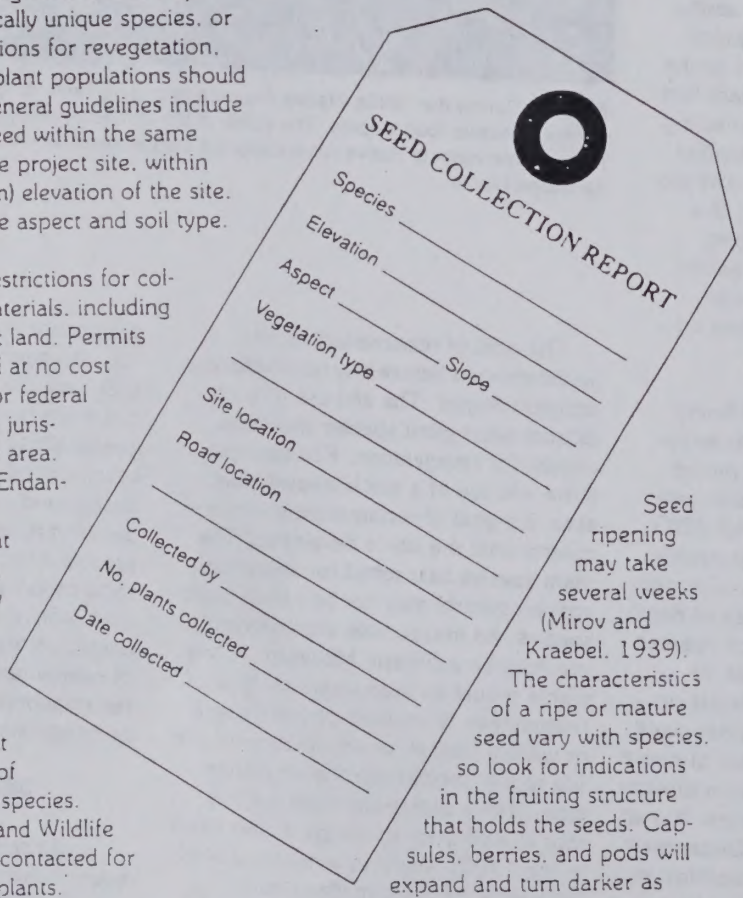
When working with sensitive species, geographically unique species, or disjunct populations for revegetation, only very local plant populations should be collected. General guidelines include collecting the seed within the same watershed as the project site, within 500 feet (150 m) elevation of the site, and on the same aspect and soil type.

There are restrictions for collecting plant materials, including seeds, on public land. Permits can be obtained at no cost from the state or federal agency that has jurisdiction over the area. The California Endangered Species and Native Plant Protection acts, administered by the California Department of Fish and Game, require a permit to collect seed of any state-listed species. The U.S. Fish and Wildlife Service can be contacted for federally listed plants.

*Terms in **boldface** type are defined on page 89.

Timing

The timing of seed collection is critical. Seed has to be collected when ripe and before it falls from the plant, rots, or is eaten. Seeds of native plants don't usually all ripen at once. Therefore, the collector has to visit the plants, take samples, decide when the greatest quantity of seed is mature, and then collect. This process usually takes more than one visit to the collection site. In addition, the seed quality may vary between stands and between years. Therefore, seed may need to be collected over more than 1 year. Care should be taken to obtain a diverse collection by gathering seed from more than one stand within the collection region, picking seed from multiple individuals within a stand, and not stripping a plant. At minimum, seed collections should be labeled with the species, geographic location including elevation, and date of collection. The collection guidelines on page 86 will help minimize inbreeding and diversify the resulting seed lot.



Seed ripening may take several weeks (Mirov and Kraebel, 1939). The characteristics of a ripe or mature seed vary with species, so look for indications in the fruiting structure that holds the seeds. Capsules, berries, and pods will expand and turn darker as seeds approach maturity. Usually seeds that are ripe will easily fall off the plant. One way to determine if a seed is ripe is to slice it in half lengthwise with a razor blade and look through a hand lens for an elongated embryo (Photos 2a, b, c). The embryo should be firm and nutlike, and not too moist.

Longevity

Longevity is the length of time seeds will remain **viable**, which depends on the species. Some plants, such as members of the pea family (Fabaceae) can live for 30 years. Seed longevity studies conducted at Michigan State University recorded seeds properly stored can remain viable for at least 160 years (Raven and others, 1981). California's native plant seeds remain viable for hours to years. Riparian plants, such as willow, cottonwood, and other members of the willow family (Salicaceae), produce seeds that live only a few hours. They die in the wild unless they are dispersed to a moist substrate like a stream bank. Seeds of ceanothus (wild lilacs) can remain viable for 9 to 24 years, depending on the species (Quick and Quick, 1961). Seeds of desert plants can remain viable for extended periods, until sufficient rain has fallen to leach inhibitory chemicals from the seed coat. The amount of water needed to remove the inhibitory seed coat is directly related to the amount of water the desert plant needs to become established. Growers should determine the longevity of their seeds and plan to use them while they are viable.

Periodicity

Some plants do not produce a large seed crop each year. Instead, they may produce more seed one year than another, or not produce any seed at all. Fir, juniper, pine, cedar, and oak are examples of trees that produce large crops of seed at 2- to 9-year intervals (U.S. Department of Agriculture, 1977). This periodicity may make it necessary for the seed collector to wait another year or more until more seed is produced.

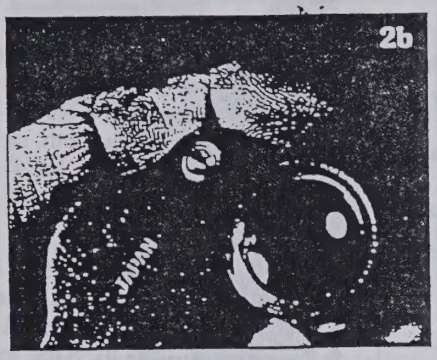
COLLECTION METHODS

The most flexible method of harvesting fruit or seeds is by hand (Photo 3). Simple hand tools such as shears and rakes, as well as wire hooks to pull the

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Photos 2a, b, c. A hand lens and razor blade can be important tools in determining when seed is ripe. The embryo should appear firm. *Photos courtesy of the California Department of Forestry and Fire Protection (CDFFP).*

limbs closer and cutters mounted on poles, can greatly increase the amount of seed collected.

Mechanical devices can be employed when larger quantities of seed are required. A vacuum harvester is often used to collect from plants that produce large amounts of seed, such as rabbitbush (*Chrysothamnus nauseousus*). The vacuum is mounted on either a backpack or vehicle, and seeds are vacuumed from the ground or plant. Tractor-drawn seed strippers and combines can be used with such shrub species as winterfat (*Krascheninnikovia lanata*) and fourwing saltbush (*Atriplex canescens*). Where large stands of grass occur, culms (grass stems) can be pulled through the mechanical fingers of a stripping device towed behind a truck (Young and Young, 1986). Mechanical tree shakers, first developed by the agricultural industry to harvest nuts from orchards, are often used to shake seeds from trees such as oaks (*Quercus* sp.).

Burlap bags, gunny sacks, and net bags that allow maximum air flow are optimum for transporting seed until it can be cleaned. Plastic bags are not recommended because they hold moisture and encourage the growth of mold.

Grasses

The seeds of grasses can be collected by stripping, either mechanically or by hand. The culms are dragged through the collector's fingers or the mechanical fingers on a truck-mounted or towed stripping device and the seeds fall into a container (Young and Young, 1986).

Herbaceous Plants

Many seeds of herbaceous plants can be collected by hand. These seeds can be harvested directly into a container or apron that is carried or worn by the picker. If the seeds readily fall from the plant, the branches can be shaken to loosen the seeds so they fall into the receptacle.

Some wildflower seeds are wind dispersed or borne in capsules that when mature, **dehisce**, or discharge their seeds. California poppy (*Eschscholzia* sp.) and Lupine (*Lupinus* sp.) are examples of seeds that are actively released from the plant. While this is a wonderful strategy for the dispersal of the species, this physiologic response presents a challenge for seed collectors. Collectors can use a ground tarp to collect seeds, put bags around the branches that are clipped closed to trap the seed, or collect seeds just before they are discharged.

Shrubs

Seed attached to the plant, such as that of Toyon (*Heteromeles arbutifolia*), can be picked or stripped by hand. A good pair of gloves is necessary equipment. Larger seeds, fruits, or pods can be collected by placing a tarp under the tree or shrub and shaking the branches or beating down the seeds



Photo 3. Seed pods of the western redbud, *Cercis occidentalis*, are ripe when red and easily separated from the plant. *Photo by Ken Davis.*

with a stick. California lilac (*Ceanothus* sp.) seeds are discharged at maturity and if not picked just before, can be lost to predation by birds, rodents, and insects that rely on seeds as a food source. The seeds of the desert shrub ocotillo (*Fouquieria splendens*) are also released quickly. The seeds of shrubs that ripen quickly can be collected by placing the seed head in a section of nylon stocking, cheesecloth, or netting (Lippitt and others, 1994).

Cactus

Seeds of spiny shrubs such as cactus can be collected by using the ridged lip of a lightweight 5- to 20-gallon (19- to 75-l) barrel to strip fruits. Salad tongs can augment this effort (Lippitt and others, 1994).

Trees

Harvesting the seeds of trees can present a physical challenge since many of the seeds are out of arm's reach, but many methods have been devised to accomplish the task. Hooking devices on light sectional poles can be extended as much as 50 feet (15 m) above ground (U.S. Department of Agriculture, 1977). Ladders and scaffolds mounted on vehicles can be used in an area where repeated collections will be made and it is economical to establish these temporary structures. Climbing into the tree is often the only method to gather seed, but some can be collected at ground level from

COLLECTION GUIDELINES

A genetically diverse collection of locally adapted plant material will increase the likelihood of success. This principle is behind the seed zones developed by the forest nursery profession for the collection of seed of commercial tree species. Decades of research on a very limited number of species were necessary to develop these seed zones. This type of data does not exist for the remaining thousands of California native plants. Therefore, some assumptions must be made prior to collection to result in a diverse, yet locally adapted, source of plant material. The following collection guidelines are condensed and modified from Guinon (1992), and can be used for most species. However, these guidelines are not appropriate for narrowly **endemic** species or rare and endangered species.

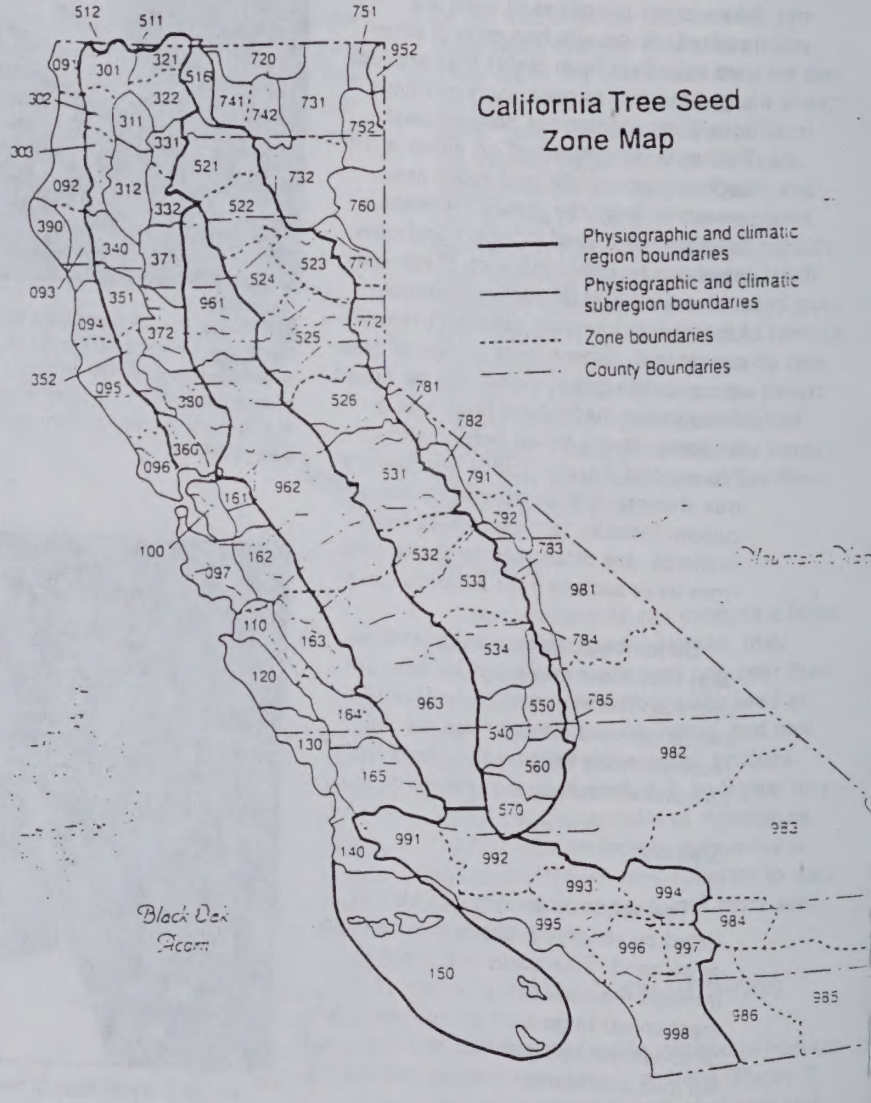
1) Collect at sites closely related ecologically to planting sites. Collection need not be restricted to project boundaries, but should be restricted by ecological boundaries (watershed, elevation, aspect, rainfall, etc.). Some indication of the genetic boundary of a species can be gained from the pollination strategy of the plant. The genes of a wind pollinated species will be more broadly distributed than those of insect pollinated species.

2) Collect **propagules** from 50 to 100 individuals spaced 325 feet (100 m) apart, rather than from a few close relatives, to limit inbreeding on the rehabilitation site and diversify the gene pool. Wind pollinated species such as pine can be collected within a 1-mile (1.6-km) radius.

3) Avoid growing donor plants in proximity to closely related **exotic species** (where genetic contamination may have occurred).

4) Document and label the genetic origin of the material until it is installed on the rehabilitation site.

5) Collect into net, cloth, or burlap bags, not plastic, to avoid moisture buildup and proliferation of detrimental fungi.



Though seed zones were developed for forestry crops, they can be adapted to all seed collecting. Zones refer to areas of regional similarity so collections should be made within the same seed zone as the project. *Modified from California Division of Forestry map, 1970.*

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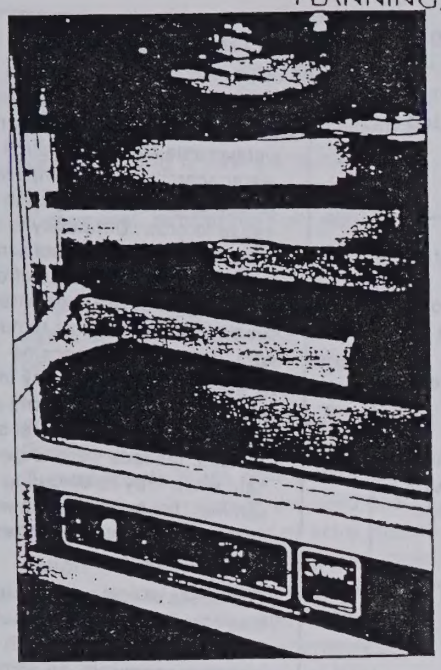


Photo 4. Cardboard box lids can hold seeds during the drying process. *Photo by Karen Wiese.*



Photo 5. Seeds can be sifted through a screen to remove unwanted material. *Photo courtesy of CDFFP.*

drooping branches or felled trees. Sometimes, seed from lower branches does not undergo pollination from wind or insects. These seeds do not fully develop and are not optimal to collect. Opening a cone or seed pod will reveal whether seeds have formed.

SEED PROCESSING

Drying

Drying seed reduces the chance of fungal infestation and aids in cleaning. Seed can be dried in open trays in a greenhouse, on an office desk, in an oven with a pilot light on, in the sun on a tarp (with provisions to protect from wind and precipitation), or in a dehydrator or drier (Photo 4). However, not all species' seeds can be successfully dried and stored. Acorns and the fleshy seeds of hollyleaf cherry *(Prunus ilicifolia)* cannot be dried without damage and must be collected fresh every year. Seed that can be dried takes a day to a week, depending on the humidity and species. Professional collectors dry the seed to approximately 7 to 14 percent seed moisture content. Viability will deteriorate through time, but with proper storage this effect can be minimized.



Photo 6. Using clean seed (on the right) will increase seeding accuracy and reduce storage volume. *Photo courtesy of CDFFP.*

Cleaning

Cleaning seed, often referred to as threshing, reduces storage volume and moisture, increases accuracy regarding the amount of seed to be placed on the site, diminishes the possibility of contamination with weed species, and minimizes the chances of fungal or insect infestation. Cleaning entails removing the seed from the stems and **chaff**, and seeds of another species. Depending on the species, the desirable end product may be pure seed, or seed encased in the capsule or protective shell.

Threshing methods such as hand sieving seeds through a screen, can be done in the field. This process consists of screening the seeds or fruits through a screen with large enough holes to allow the seeds or fruits to drop through but not the chaff (Photos 5 and 6). Seeds can also be cleaned simply by using a slant board. Using a gloved hand, the seeds are rubbed against the slant board or screen and gravity separates heavier material (seed, sand, and rocks) from the lighter chaff. Other seeds can be separated from the chaff by rubbing them against fine sand paper. Seeds that have a fleshy covering, such as those of coffeeberry (*Rhamnus californica*) and toyon (*Heteromeles arbutifolia*), can be removed from the pulp by hand or put through a meat grinder (Photo 7). The meat grinder will free most of the flesh from the seed, and the remaining pulp must be separated from the seed by washing, drying, and using an air separator to remove the dried skin.

The seeds of most conifer cones require drying to open them. Once dried, the cone can be cut or whacked with a hammer, and seeds can be shaken out and separated from the cone scales and debris.

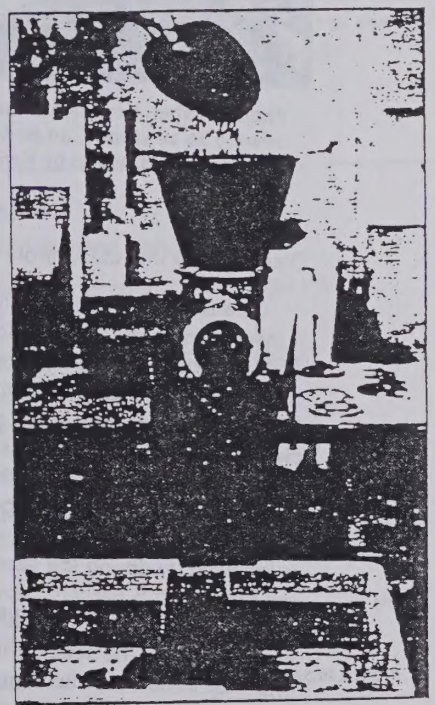


Photo 7. A meat grinder, fitted with the correct size plate, can remove most of the pulp from the seeds. *Photo courtesy of CDFFP.*

Seed Separators

Harvested seed often contains the seeds of other plants and empty or non-viable seed. To improve the purity, the seeds are put through an air separator which blows air to separate materials by weight (Photo 8). A hair dryer, on a low setting can also be used to blow light-weight material from the seeds.

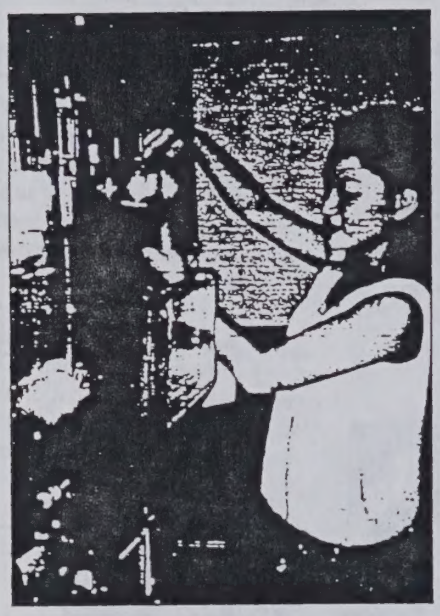


Photo 8. When large quantities of seed need to be separated, an air separator should be used. *Photo by Karen Wiese.*

Disease and Insect Control

Cleaned stored seed can be ruined if insects and fungi attack. Most insects and fungi can be controlled by keeping the seed in dry, near-freezing or sub-freezing storage. With some plant species, these cold temperatures will kill the seed. An effective insecticidal treatment is emersion in a solution of one part Malathion in five parts water. This is followed by drying the seeds and dusting them with 5 percent Sevin (Lippitt and others, 1994). Sevin will remain in proximity to the seed during sowing and may inhibit beneficial **mycorrhizal** fungi.

Fungicides can be toxic to some seeds and may be avoided entirely by surface-sterilizing the seeds with a 90-second hot water soak followed by drying and storage. Substituting hot vegetable oil is also effective. The seeds do not easily absorb the oil so the embryo is not as likely to be affected (Lippitt and others, 1994).

SEED PREPARATION SERVICE

Often, seed collectors will rely on experts to clean, dry, and store seeds, or even plant and bring them to the seedling stage. Seed cleaning, storage, testing, and growing is done for a fee by CDFFP, L.A. Moran Reforestation Center in Davis, California. Laurie Lippitt, Manager, can be reached at (916) 322-2299.

SEED STORAGE

The two most important factors for optimizing stored seed longevity are low temperature and moisture content. When storage conditions are not ideal, seed should be tested for viability prior to usage. The containers used to store the seeds should be rodent and bird proof. Seed should be checked regularly and those with signs of mold and mildew discarded.

COLD STORAGE

A Yukon mining engineer found seeds of the arctic tundra lupine (*Lupinus arcticus*) in a frozen lemming burrow that were carbon dated to be at least 10,000 years old. With their cold requirement met, the seeds germinated within 48 hours of planting (Raven and others, 1981).

SEED DORMANCY

Seeds do not grow at the same rate throughout the year. During unfavorable conditions, such as water scarcity or low temperature, plants limit their growth or cease to grow. Dormancy is a physiological condition of arrested growth. After periods of dormancy, growth resumes when limiting factors such as temperature, water, or light become available again. The delay in germination until conditions are right optimizes the survival of the species. If seeds were to germinate when they ripen during summer, the young plants would have difficulty with the hottest part of the year.

The seeds of some desert species germinate only when sufficient rain has fallen to leach innibitory chemicals, an amount directly related to the seedling's needs. This is why, in some years following high rainfall, the desert puts on a spectacular show of flowers, with some plants blooming for the first time in 15 years.

Seed Storage Temperature

Once the seed is dried and cleaned, it needs to be stored in a cool, dry place. Seed will last the longest if stored at 0 degrees Fahrenheit (-18° C) at low humidity. Small amounts of dry, clean seed can be placed in an airtight jar and left in the back of a refrigerator until needed. Many commercial growers leave a 1-to-2-inch- (3-to-5-cm-) wide opening in plastic storage bags to allow for gas exchange. Larger amounts of seed may require commercial-size refrigerators.

If seed has the correct low-moisture content, freezing is best. If seed is not dry enough, storage below freezing subjects the embryo to ice crystal damage.

It is often thought that once seed has been collected it can be immediately planted, either direct seeded at the site or in the nursery in containers. The seeds of most annual plants will germinate with no difficulty within

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several weeks. However, the seeds of most perennial plants have a natural mechanism that prevents them from immediately germinating when mature. To break dormancy, perennial plant seeds take 3 to 6 weeks and often longer and may require a combination of chemical, temperature, or light treatments.

Determining the correct seed pretreatment to overcome dormancy can be a challenge to anyone interested in growing native plants, but *Seed Propagation of Native California Plants* (Emery, 1988) is helpful in this regard. Treatments to break dormancy include scarification (scratching the seed coat—such as with sand paper or acid), stratification (placing the seeds between moist papers at low temperatures), soaking either in cold or hot water, chilling, exposure to elevated temperatures, exposure to a certain type of light (white versus red), exposure to a specific duration of light, fluctuating temperature, chemical treatments, and any combination of these.

FIRE INDUCED GERMINATION

Some species of plants have seeds that require fire for germination. In nature, the seeds of these plants have adapted to sprout after fire. Either intense heat from fire melts or cracks the seed coat, or a chemical stimulates germination after the wood is allowed to char (Keeley and Keeley, 1994). Chaparral species, such as California lilac (*Ceanothus* sp.) and some species of manzanita (*Arctostaphylos* sp.) are well known for this survival strategy. To get these species to germinate in the nursery, growers simulate a wildland fire by sowing the seeds in soil in a fireproof tray, covering them with a layer of pine needles 4 to 6 inches (10-15 cm) deep, and igniting the needles (Emery, 1988). After the seedbed has cooled, it is watered thoroughly and treated as any batch of seeds. This is often enough to break the dormancy of these fire adapted species.

REPRODUCING PLANTS WITHOUT SEED

Some species of plants do not produce adequate amounts of viable seed and need to be propagated vegetatively, from cuttings or underground roots. With a little practice and some experimentation, a grower can determine which species can or are best propagated vegetatively, since they usually resprout readily in the wild. The best candidates are those that produce underground stems (rhizomes) or above-ground, horizontal stems (stolons) from which new plants arise, such as is common with sedges and rushes, or plants that can be grown from bits of stem, such as willows and blackberries. Plants often propagated vegetatively include willow species (*Salix* sp.), cottonwood (*Populus* sp.), blackberry (*Rubus* sp.), dunegrass (*Leymus mollis* ssp. *mollis*), saltgrass (*Distichlis spicata*), pickleweed (*Salicornia* sp.), and red alder (*Alnus oregona*).

Some species, such as shad-scale (*Atriplex canescens*) and blackbush (*Coleogyne ramosissima*), can be very difficult to grow from cuttings or from seeds germinated in a greenhouse and planted in containers outdoors. Obviously, growers need some familiarity with the life cycle and ecology of the desired species to make these decisions. The availability (or nonavailability) of seeds or plant materials may determine the choice of propagule.

ACKNOWLEDGMENTS

I would like to thank Laurie Lippitt, of the California Department of Forestry and Fire Protection, and Gail Newton and Mary Ann Showers, of the California Department of Conservation, for their technical assistance during the preparation of this article. I would also like to thank Steve Newton-Reed, and Amy Vong of the California Department of Conservation, for their support in producing serveral of the photographs used in this article.

GLOSSARY

Chaff: The husks of grain after separation from the seed.

Dehisce: The opening of an anther, fruit, or other structure to permit the escape of the reproductive bodies, such as seeds.

Ecotype: A locally adapted variant of an organism, differing genetically from others.

Edaphic: Pertaining to soil conditions that influence plant growth.

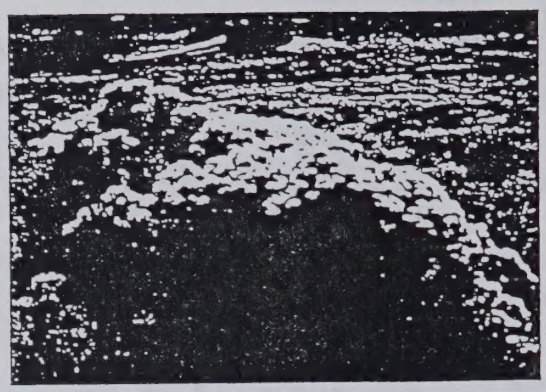
Endemic: Pertaining to a highly localized distribution.

Exotic species: A species that originated in another geographic area. Yellow star thistle and dandelions, native to Europe, are examples of non-native or exotic plants.

Mycorrhizal: The favorable combination of the hyphae of certain fungi with the root of a plant, where the fungi aid in the absorbtion of water and nutrients.

Propagule: The part of a plant that is used to reproduce the plant vegetatively, for example by leaf, stem cuttings, or root.

Viable: Capable of germinating or growing under favorable conditions.



The perennial plant rabbitbrush (*Chrysothamnus* sp.) grows well in dry, disturbed sites. *Photo by Karen Wiese.*



Native grasses such as this needlegrass (*Nasella* sp.) are growing in popularity and availability. *Photo by Karen Wiese.*



Native legumes such as this lupine (*Lupinus* sp.) have the ability to convert atmospheric nitrogen to a form that can be used by the plant. *Photo by Karen Wiese.*

Cypress, mountain mahogany, larkspur, and needlegrass illustrations are by Mary Ann Showers. Ceanothus and black oak acorn drawings are from Mirov and Kraebel (1939). Buckeye seedling is from U.S. Department of Agriculture (1977).

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Nursery Sources for California Native Plants (Showers and Wiese, 1995) is a good reference for seed suppliers and people who will custom-collect seed for a project. It lists more than 1,400 taxa and the nurseries that supply each. The source of purchased native plant seed should be as close to the project site as possible. *Nursery Sources*, OFR 90-04, can be purchased for $10.00, prepaid, from:

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Division of Mines and Geology
Open-File Report Desk
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Sacramento, CA 95814-3532
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SURFACE MINING AND RECLAMATION ACT AND ASSOCIATED REGULATIONS

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As amended by:

Senate Bill 1300, Nejedly - 1980 Statutes
Assembly Bill 110, Areias - 1984 Statutes
Senate Bill 593, Royce - 1985 Statutes
Senate Bill 1261, Seymour - 1986 Statutes
Assembly Bill 747, Sher - 1987 Statutes
Assembly Bill 3551, Sher - 1990 Statutes
Assembly Bill 3903, Sher - 1990 Statutes
Assembly Bill 1506, Sher - 1991 Statutes
Senate Bill 1569, Rogers - 1992 Statutes
Assembly Bill 3098, Sher - 1992 Statutes
Assembly Bill 723, Sher - 1993 Statutes
Assembly Bill 904, Sher - 1993 Statutes
Assembly Bill 867, Sher - 1994 Statutes
Senate Bill 273, Leslie - 1995 Statutes
Senate Bill 614, Craven et al - 1995 Statutes
Assembly Bill 1373, Olberg - 1996 Statutes, and
Senate Bill 1549, Monteith - 1996 Statutes

Article 1. General Provisions

§ 2710. This chapter shall be known and may be cited as the Surface Mining and Reclamation Act of 1975.

§ 2711. (a) The Legislature hereby finds and declares that the extraction of minerals is essential to the continued economic well-being of the state and to the needs of the society, and that the reclamation of mined lands is necessary to prevent or minimize adverse effects on the environment and to protect the public health and safety.

(b) The Legislature further finds that the reclamation of mined lands as provided in this chapter will permit the continued mining of minerals and will provide for the protection and subsequent beneficial use of the mined and reclaimed land.

(c) The Legislature further finds that surface mining takes place in diverse areas where the geologic, topographic, climatic, biological, and social conditions are significantly different and that reclamation operations and the specifications therefore may vary accordingly.

§ 2712. It is the intent of the Legislature to create and maintain an effective and comprehensive surface mining and reclamation policy with regulation of surface mining operations so as to assure that:

(a) Adverse environmental effects are prevented or minimized and that mined lands are reclaimed to a usable condition which is readily adaptable for alternative land uses.

(b) The production and conservation of minerals are encouraged, while giving consideration to values relating to recreation, watershed, wildlife, range and forage, and aesthetic enjoyment.

(c) Residual hazards to the public health and safety are eliminated.

§ 2713. It is not the intent of the Legislature by the enactment of this chapter to take private property for public use without payment of just compensation in violation of the California and United States Constitutions.

§ 2714. This chapter does not apply to any of the following activities:

(a) Excavations or grading conducted for farming or onsite construction or for the purpose of restoring land following a flood or natural disaster.

(b) Onsite excavation and onsite earthmoving activities that are an integral and necessary part of a construction project that are undertaken to prepare a site for construction of structures, landscaping, or other land improvements, including the related excavation, grading, compaction, or the creation of fills, road cuts, and embankments, whether or not surplus materials are exported from the site, subject to all of the following conditions:

(1) All required permits for the construction, landscaping, or related land improvements have been approved by a public agency in accordance with applicable provisions of state law and locally adopted plans and ordinances, including, but not limited to, Division 13 (commencing with Section 21000).

(2) The lead agency's approval of the construction project included consideration of the onsite excavation and onsite earthmoving activities pursuant to Division 13 (commencing with Section 21000).

(3) The approved construction project is consistent with the general plan or zoning of the site.

(4) Surplus materials shall not be exported from the site unless and until actual construction work has commenced and shall cease if it is determined that construction activities have terminated, have been indefinitely suspended, or are no longer being actively pursued.

(c) Operation of a plant site used for mineral processing, including associated onsite structures, equipment, machines, tools, or other materials, including the onsite stockpiling and onsite recovery of mined materials, subject to all of the following conditions:

(1) The plant site is located on lands designated for industrial or commercial uses in the applicable county or city general plan.

(2) The plant site is located on lands zoned industrial or commercial, or are contained within a zoning category intended exclusively for industrial activities by the applicable city or county.

(3) None of the minerals being processed are being extracted onsite.

(4) All reclamation work has been completed pursuant to the approved reclamation plan for any mineral extraction activities that occurred onsite after January 1, 1976.

(d) Prospecting for, or the extraction of, minerals for commercial purposes and the removal of overburden in total amounts of less than 1,000 cubic yards in any one location of one acre or less.

(e) Surface mining operations that are required by federal law in order to protect a mining claim, if those operations are conducted solely for that purpose.

(f) Any other surface mining operations that the board, as defined by section 2001, determines to be of an infrequent nature and which involve only minor surface disturbances.

(g) The solar evaporation of sea water or bay water for the production of salt and related minerals.

(h) Emergency excavations or grading conducted by the Department of Water Resources or the Reclamation Board for the purpose of averting, alleviating, repairing, or restoring damage to property due to imminent or recent floods, disasters, or other emergencies.

(i) (1) Surface mining operations conducted on lands owned or leased, or upon which easements or rights-of-way have been obtained, by the Department of Water Resources for the purpose of the State Water Resources Development System or flood control, and surface mining operations on lands owned or leased, or upon which easements or rights-of-way have been obtained, by the Reclamation Board for the purpose of flood control, if the Department of Water Resources adopts, after submission to and consultation with, the Department of Conservation, a reclamation plan for lands affected by these activities, and those lands are reclaimed in conformance with the standards specified in regulations of the board adopted pursuant to this chapter. The Department of Water Resources shall provide an annual report to the Department of Conservation by the date specified by the Department of Conservation on these mining activities.

(2) Nothing in this subdivision shall require the Department of Water Resources or the Reclamation Board to obtain a permit or secure approval of a reclamation plan from any city or county in order to conduct surface mining operations specified in paragraph (1). Nothing in this subdivision shall preclude the bringing of an enforcement action pursuant to Section 2774.1, if it is determined that a surface mine operator, acting under contract with the Department of Water Resources or the Reclamation Board on lands other than those owned or leased, or upon which easements or rights-of-way have been obtained, by the Department of Water Resources or the Reclamation Board, is otherwise not in compliance with this chapter.

(j) (1) Excavations or grading for the exclusive purpose of obtaining materials for roadbed construction and maintenance conducted in connection with timber operations or forest management on land owned by the same person or entity. This exemption is limited to excavation and grading that is conducted adjacent to timber operation or forest management roads and shall not apply to onsite excavation or grading that occurs within 100 feet of a Class One watercourse or 75 feet of a Class Two watercourse, or to excavation for materials that are, or have been, sold for commercial purposes.

(2) This exemption shall be available only if slope stability and erosion are controlled in accordance with subdivision (f) of Section 3704 and subdivision (d) of Section 3706 of Title 14 of the California Code of Regulations and, upon closure of the site, the person closing the site implements, where necessary, revegetation measures and postclosure uses in consultation with the Department of Forestry and Fire Protection.

(k) Excavations, grading, or other earthmoving activities in an oil or gas field that are integral to, and necessary for, ongoing operations for the extraction of oil or gas that comply with all of the following conditions:

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(1) The operations are being conducted in accordance with Division 3 (commencing with Section 3000).

(2) The operations are consistent with any general plan or zoning applicable to the site.

(3) The earthmoving activities are within oil or gas field properties under a common owner or operator.

(4) No excavated materials are sold for commercial purposes.

§ 2715. No provision of this chapter or any ruling, requirement, or policy of the board is a limitation on any of the following:

(a) On the police power of any city or county or on the power of any city or county to declare, prohibit, and abate nuisances.

(b) On the power of the Attorney General, at the request of the board, or upon his own motion, to bring an action in the name of the people of the State of California to enjoin any pollution or nuisance.

(c) On the power of any state agency in the enforcement or administration of any provision of law which it is specifically authorized or required to enforce or administer.

(d) On the right of any person to maintain at any time any appropriate action for relief against any private nuisance as defined in Part 3 (commencing with Section 3479) of Division 4 of the Civil Code or for any other private relief.

(e) On the power of any lead agency to adopt policies, standards, or regulations imposing additional requirements on any person if the requirements do not prevent the person from complying with the provisions of this chapter.

(f) On the power of any city or county to regulate the use of buildings, structures, and land as between industry, business, residents, open space (including agriculture, recreation, the enjoyment of scenic beauty, and the use of natural resources), and other purposes.

§ 2716. Any person may commence an action on his or her own behalf against the board, the State Geologist, or the director for a writ of mandate pursuant to Chapter 2 (commencing with Section 1084) of Title 1 of Part 3 of the Code of Civil Procedure to compel the board, the State Geologist, or the director to carry out any duty imposed upon them pursuant to this chapter.

§ 2717. (a) The board shall submit to the Legislature on December 1st of each year a report on the actions taken pursuant to this chapter during the preceding fiscal year. The report shall include a statement of the actions, including legislative recommendations, which are necessary to carry out more completely the purposes and requirements of this chapter.

(b) For purposes of ensuring compliance with Section 10295.5 of the Public Contract Code, on and after July 1, 1993, the department shall, at a minimum, quarterly publish in the California Regulatory Notice Register, or otherwise make available upon request to the Department of General Services or any other state agency, a list identifying all of the following:

(1) Surface mining operations for which a report has been submitted pursuant to Section 2207 which indicates that the reclamation plan and the financial assurances have been approved.

(2) Surface mining operations for which an appeal is pending before the board pursuant to subdivision (e) of Section 2770, provided that the appeal shall not have been pending before the board for more than 180 days.

§ 2718. If any provision of this chapter or the application thereof to any person or circumstance is held invalid, such invalidity shall not affect other provisions or applications of the chapter which can be given effect without the invalid provision or application, and to this end the provisions of this chapter are severable.

§ 2719. Notwithstanding any other provision of law, neither the state nor any county, city, district, or other political subdivision shall be exempt from any fee imposed upon a mining operation pursuant to subdivision (d) of Section 2207.

Article 2. Definitions

§ 2725. Unless the context otherwise requires, the definitions set forth in this article shall govern the construction of this chapter.

§ 2726. "Area of regional significance" means an area designated by the board pursuant to Section 2790 which is known to contain a deposit of minerals, the extraction of which is judged to be of prime importance in meeting future needs for minerals in a particular region of the state within which the minerals are located and which, if prematurely developed for alternate incompatible land uses, could result in the permanent loss of minerals that are of more than local significance.

§ 2727. "Area of statewide significance" means an area designated by the board pursuant to Section 2790 which is known to contain a deposit of minerals, the extraction of which is judged to be of prime importance in meeting future needs for minerals in the state and which, if prematurely

developed for alternate incompatible land uses, could result in the permanent loss of minerals that are of more than local or regional significance.

§ 2727.1 "Idle" means to curtail for a period of one year or more surface mining operations by more than 90 percent of the operation's previous maximum annual mineral production, with the intent to resume those surface mining operations at a future date.

§ 2728. "Lead agency" means the city, county, San Francisco Bay Conservation and Development Commission, or the board which has the principal responsibility for approving a surface mining operation or reclamation plan pursuant to this chapter.

§ 2729. "Mined lands" includes the surface, subsurface, and ground water of an area in which surface mining operations will be, are being, or have been conducted, including private ways and roads appurtenant to any such area, land excavations, workings, mining waste, and areas in which structures, facilities, equipment, machines, tools, or other materials or property which result from, or are used in, surface mining operations are located.

§ 2730. "Mining waste" includes the residual of soil, rock, mineral, liquid, vegetation, equipment, machines, tools, or other materials or property directly resulting from, or displaced by, surface mining operations.

§ 2731. "Operator" means any person who is engaged in surface mining operations, himself, or who contracts with others to conduct operations on his behalf, except a person who is engaged in surface mining operations as an employee with wages as his sole compensation.

§ 2732. "Overburden" means soil, rock, or other materials that lie above a natural mineral deposit or in between mineral deposits, before or after their removal by surface mining operations.

§ 2732.5. "Permit" means any authorization from, or approval by, a lead agency, the absence of which would preclude surface mining operations.

§ 2733. "Reclamation" means the combined process of land treatment that minimizes water degradation, air pollution, damage to aquatic or wildlife habitat, flooding, erosion, and other adverse effects from surface mining operations, including adverse surface effects incidental to underground mines, so that mined lands are reclaimed to a usable condition which is readily adaptable for alternate land uses and create no danger to public health or safety. The process may extend to affected lands surrounding mined lands, and may require backfilling, grading, resoiling, revegetation, soil compaction, stabilization, or other measures.

§ 2734. "State policy" means the regulations adopted by the board pursuant to Section 2755.

§ 2735. "Surface mining operations" means all, or any part of, the process involved in the mining of minerals on mined lands by removing overburden and mining directly from the mineral deposits, open-pit mining of minerals naturally exposed, mining by the auger method, dredging and quarrying, or surface work incident to an underground mine. Surface mining operations shall include, but are not limited to:

(a) Inplace distillation or retorting or leaching.

(b) The production and disposal of mining waste.

(c) Prospecting and exploratory activities.

Article 3. District Committees

§ 2740. In carrying out the provisions of this chapter, the board may establish districts and appoint one or more district technical advisory committees to advise the board. In establishing districts for these committees, the board shall take into account physical characteristics, including, but not limited to, climate, topography, geology, type of overburden, and principal mineral commodities. Members of the committees shall be selected and appointed on the basis of their professional qualifications and training in mineral resource conservation, development and utilization, land use planning, mineral economics, or the reclamation of mined lands.

§ 2741. The members of the committee shall receive no compensation for their services, but shall be entitled to their actual and necessary expenses incurred in the performance of their duties.

Article 4. State Policy for the Reclamation of Mined Lands

§ 2755. The board shall adopt regulations which establish state policy for the reclamation of mined lands in accordance with the general provisions set forth in Article 1 (commencing with Section 2710) of this chapter and pursuant to Chapter 4.5 (commencing with Section 11371) of Part 1 of Division 3 of Title 2 of the Government Code.

§ 2756. State policy shall apply to the conduct of surface mining operations and shall include, but shall not be limited to, measures to be employed by lead agencies in specifying grading, backfilling,

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resoiling, revegetation, soil compaction, and other reclamation requirements, and for soil erosion control, water quality and watershed control, waste disposal, and flood control.

§ 2757. The state policy adopted by the board shall be based upon a study of the factors that significantly affect the present and future condition of mined lands, and shall be used as standards by lead agencies in preparing specific and general plans, including the conservation and land use elements of the general plan and zoning ordinances. The state policy shall not include aspects of regulating surface mining operations which are solely of local concern, and not of statewide or regional concern, as determined by the board, such as, but not limited to, hours of operation, noise, dust, fencing, and purely aesthetic considerations.

§ 2758. Such policy shall include objectives and criteria for all of the following:

(a) Determining the lead agency pursuant to the provisions of Section 2771.

(b) The orderly evaluation of reclamation plans.

(c) Determining the circumstances, if any, under which the approval of a proposed surface mining operation by a lead agency need not be conditioned on a guarantee assuring reclamation of the mined lands.

§ 2759. The state policy shall be continuously reviewed and may be revised. During the formulation or revision of the policy, the board shall consult with, and carefully evaluate the recommendations of, the director, any district technical advisory committees, concerned federal, state, and local agencies, educational institutions, civic and public interest organizations, and private organizations and individuals.

§ 2760. The board shall not adopt or revise the state policy, unless a public hearing is first held respecting its adoption or revision. At least 30 days prior to the hearing, the board shall give notice of the hearing by publication pursuant to Section 6061 of the Government Code.

§ 2761. (a) On or before January 1, 1977, and, as a minimum, after the completion of each decennial census, the Office of Planning and Research shall identify portions of the following areas within the state which are urbanized or are subject to urban expansion or other irreversible land uses which would preclude mineral extraction:

(1) Standard metropolitan statistical areas and such other areas for which information is readily available.

(2) Other areas as may be requested by the board.

(b) In accordance with a time schedule, and based upon guidelines adopted by the board, the State Geologist shall classify, on the basis solely of geologic factors, and without regard to existing land use and land ownership, the areas identified by the Office of Planning and Research, any area for which classification has been requested by a petition which has been accepted by the board, or any other areas as may be specified by the board, as one of the following:

(1) Areas containing little or no mineral deposits.

(2) Areas containing significant mineral deposits.

(3) Areas containing mineral deposits, the significance of which requires further evaluation.

The State Geologist shall require the petitioner to pay the reasonable costs of classifying an area for which classification has been requested by the petitioner.

(c) The State Geologist shall transmit the information to the board for incorporation into the state policy and for transmittal to lead agencies.

§ 2762. (a) Within 12 months of receiving the mineral information described in Section 2761, and also within 12 months of the designation of an area of statewide or regional significance within its jurisdiction, every lead agency shall, in accordance with state policy, establish mineral resource management policies to be incorporated in its general plan which will:

(1) Recognize mineral information classified by the State Geologist and transmitted by the board.

(2) Assist in the management of land use which affect areas of statewide and regional significance.

(3) Emphasize the conservation and development of identified mineral deposits.

(b) Every lead agency shall submit proposed mineral resource management policies to the board for review and comment prior to adoption.

(c) Any subsequent amendment of the mineral resource management policy previously reviewed by the board shall also require review and comment by the board.

(d) If any area is classified by the State Geologist as an area described in paragraph (2) of subdivision (b) of Section 2761, and the lead agency either has designated that area in its general plan as having important minerals to be protected pursuant to subdivision (a), or otherwise has not yet acted pursuant to subdivision (a), then prior to permitting a use which would threaten the potential to extract minerals in that area, the lead agency shall prepare,

in conjunction with preparing any environmental document required by Division 13 (commencing with Section 21000), or in any event if no such document is required, a statement specifying its reasons for permitting the proposed use, and shall forward a copy to the State Geologist and the board for review.

If the proposed use is subject to the requirements of Division 13 (commencing with Section 21000), the lead agency shall comply with the public review requirements of that division. Otherwise, the lead agency shall provide public notice of the availability of its statement by all of the following:

(1) Publishing the notice at least one time in a newspaper of general circulation in the area affected by the proposed use.

(2) Directly mailing the notice to owners of property within one-half mile of the parcel or parcels on which the proposed use is located as those owners are shown on the latest equalized assessment role.

The public review period shall not be less than 60 days from the date of the notice and shall include at least one public hearing. The lead agency shall evaluate comments received and shall prepare a written response. The written response shall describe the disposition of the major issues raised. In particular, when the lead agency's position on the proposed use is at variance with recommendations and objections raised in the comments, the written response shall address in detail why specific comments and suggestions were not accepted.

(e) Prior to permitting a use which would threaten the potential to extract minerals in an area classified by the State Geologist as an area described in paragraph (3) of subdivision (b) of Section 2761, the lead agency may cause to be prepared an evaluation of the area in order to ascertain the significance of the mineral deposit located therein. The results of such evaluation shall be transmitted to the State Geologist and the board.

§ 2763. (a) If an area is designated by the board as an area of regional significance, and the lead agency either has designated that area in its general plan as having important minerals to be protected pursuant to subdivision (a) of Section 2762, or otherwise has not yet acted pursuant to subdivision (a) of Section 2762, then prior to permitting a use which would threaten the potential to extract minerals in that area, the lead agency shall prepare a statement specifying its reasons for permitting the proposed use, in accordance with the requirements set forth in subdivision (d) of Section 2762. Lead agency land use decisions involving areas designated as being of regional significance shall be in accordance with the lead agency's mineral resource management policies and shall also, in balancing mineral values against alternative land uses, consider the importance of these minerals to their market region as a whole and not just their importance to the lead agency's area of jurisdiction.

(b) If an area is designated by the board as an area of statewide significance, and the lead agency either has designated that area in its general plan as having important minerals to be protected pursuant to subdivision (a) of Section 2762, or otherwise has not yet acted pursuant to subdivision (a) of Section 2762, then prior to permitting a use which would threaten the potential to extract minerals in that area, the lead agency shall prepare a statement specifying its reasons for permitting the proposed use, in accordance with the requirements set forth in subdivision (d) of Section 2762. Lead agency land use decisions involving areas designated as being of statewide significance shall be in accordance with the lead agency's mineral resource management policies and shall also, in balancing mineral values against alternative land uses, consider the importance of the mineral resources to the state and nation as a whole.

§ 2764. (a) Upon the request of an operator or other interested person and payment by the requesting person of the estimated cost of processing the request, the lead agency having jurisdiction shall amend its general plan, or prepare a new specific plan or amend any applicable specific plan, that shall, with respect to the continuation of the existing surface mining operation for which the request is made, plan for future land uses in the vicinity of, and access routes serving, the surface mining operation in light of the importance of the minerals to their market region as a whole, and not just their importance to the lead agency's area of jurisdiction.

(b) In adopting amendments to the general plan, or adopting or amending a specific plan, the lead agency shall make written legislative findings as to whether the future land uses and particular access routes will be compatible or incompatible with the continuation of the surface mining operation, and if they are found to be incompatible, the findings shall include a statement of the reasons why they are to be provided for, notwithstanding the importance of the minerals to their market region as a whole or

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their previous designation by the board, as the case may be.

(c) Any evaluation of a mineral deposit prepared by a lead agency for the purpose of carrying out this section shall be transmitted to the State Geologist and the board.

(d) The procedure provided for in this section shall not be undertaken in any area that has been designated pursuant to Article 6 (commencing with Section 2790) if mineral resource management policies have been established and incorporated in the lead agency's general plan in conformance with Article 4 (commencing with Section 2755).

Article 5. Reclamation of Mined Lands and the Conduct of Surface Mining Operations

§ 2770. (a) Except as provided in this section, no person shall conduct surface mining operations unless a permit is obtained from, a reclamation plan has been submitted to and approved by, and financial assurances for reclamation have been approved by, the lead agency for the operation pursuant to this article.

(b) Any person with an existing surface mining operation who has vested rights pursuant to Section 2776 and who does not have an approved reclamation plan shall submit a reclamation plan to the lead agency not later than March 31, 1988. If a reclamation plan application is not on file by March 31, 1988, the continuation of the surface mining operation is prohibited until a reclamation plan is submitted to the lead agency. For purposes of this subdivision, reclamation plans may consist of all or the appropriate sections of any plans or written agreements previously approved by the lead agency or another agency, together with any additional documents needed to substantially meet the requirements of Sections 2772 and 2773 and the lead agency surface mining ordinance adopted pursuant to subdivision (a) of Section 2774, provided that all documents which together were proposed to serve as the reclamation plan are submitted for approval to the lead agency in accordance with this chapter.

(c) If a person with an existing surface mining operation has received lead agency approval of its financial assurances for reclamation prior to January 1, 1991, the lead agency shall administratively review those existing financial assurances in accordance with subdivision (d) prior to January 1, 1992. The review of existing financial assurances shall not be considered a project for purposes of Division 13 (commencing with Section 21000). Any person with an existing surface mining operation which does not have financial assurances that received lead agency approval prior to January 1, 1991, shall submit financial assurances for reclamation for review in accordance with subdivision (d).

(d) The lead agency's review of reclamation plans submitted pursuant to subdivision (b) or of financial assurances pursuant to subdivision (c) is limited to whether the plan or the financial assurances substantially meet the applicable requirements of Sections 2772, 2773, and 2773.1, and the lead agency surface mining ordinance adopted pursuant to subdivision (a) of Section 2774, but, in any event, the lead agency shall require that financial assurances for reclamation be sufficient to perform reclamation of lands remaining disturbed. Reclamation plans or financial assurances determined to substantially meet these requirements shall be approved by the lead agency for purposes of this chapter. Reclamation plans or financial assurances determined not to substantially meet these requirements shall be returned to the operator within 60 days. The operator has 60 days to revise the plan or financial assurances to address identified deficiencies, at which time the revised plan or financial assurances shall be returned to the lead agency for review and approval. Except as specified in subdivision (e) or (i), unless the operator has filed on or before July 1, 1990, an appeal pursuant to subdivision (e) with regard to nonapproval of the reclamation plan, or has filed on or before January 1, 1994, an appeal pursuant to subdivision (e) with regard to nonapproval of financial assurances, and that appeal is pending before the board, the continuation of the surface mining operation is prohibited until a reclamation plan and financial assurances for reclamation are approved by the lead agency.

(e) Any person who, based on the evidence of the record, can substantiate that a lead agency has either (1) failed to act according to due process or has relied on considerations not related to the specific applicable requirements of Sections 2772, 2773, and 2773.1, and the lead agency surface mining ordinance adopted pursuant to subdivision (a) of Section 2774, in reaching a decision to deny approval of a reclamation plan or financial assurances for reclamation, (2) failed to act within a reasonable time of receipt of a completed application, or (3) failed to review and approve reclamation plans or financial assurances as required by subdivisions (c) and (d), may appeal that action or inaction to the board.

(f) The board may decline to hear an appeal if it determines that the appeal raises no substantial issues related to the lead agency's review pursuant to this section.

(g) Appeals that the board does not decline to hear shall be scheduled and heard at a public hearing within 45 days of the filing of the appeal, or any longer period as may be mutually agreed upon by the board and the person filing the appeal. In hearing an appeal, the board shall only determine whether the reclamation plan or the financial assurances substantially meet the applicable requirements of Sections 2772, 2773, 2773.1, and the lead agency surface mining ordinance adopted pursuant to subdivision (a) of Section 2774. A reclamation plan or financial assurances determined to meet these requirements shall be approved. A reclamation plan or financial assurances determined not to meet these requirements shall be returned to the person filing the appeal with a notice of deficiencies, who shall be granted, once only, a period of 30 days, or a longer period mutually agreed upon by the operator and the board, to correct the noted deficiencies and submit the revised reclamation plan or the revised financial assurances to the lead agency for review and approval.

(h)(1) Within 90 days of a surface mining operation becoming idle, as defined in Section 2727.1, the operator shall submit to the lead agency for review and approval, an interim management plan. The review and approval of an interim management plan shall not be considered a project for purposes of Division 13 (commencing with Section 21000). The approved interim management plan shall be considered an amendment to the surface mining operation's approved reclamation plan, for purposes of this chapter. The interim management plan shall provide measures the operator will implement to maintain the site in compliance with this chapter, including, but not limited to, all permit conditions.

(2) The interim management plan may remain in effect for a period not to exceed five years, at which time the lead agency shall do one of the following:

(A) Renew the interim management plan for another period not to exceed five years, if the lead agency finds that the surface mining operator has complied fully with the interim management plan.

(B) Require the surface mining operator to commence reclamation in accordance with its approved reclamation plan.

(3) The financial assurances required by Section 2773.1 shall remain in effect during the period that the surface mining operation is idle. If the surface mining operation is still idle after the expiration of its interim management plan, the surface mining operation shall commence reclamation in accordance with its approved reclamation plan.

(4) Within 60 days of the receipt of the interim management plan, or a longer period mutually agreed upon by the lead agency and the operator, the lead agency shall review and approve the plan in accordance with its ordinance adopted pursuant to subdivision (a) of Section 2774, so long as the plan satisfies the requirements of this subdivision, and so notify the operator in writing. Otherwise, the lead agency shall notify the operator in writing of any deficiencies in the plan. The operator shall have 30 days, or a longer period mutually agreed upon by the operator and the lead agency, to submit a revised plan.

(5) The lead agency shall approve or deny approval of the revised interim management plan within 60 days of receipt. If the lead agency denies approval of the revised interim management plan, the operator may appeal that action to the lead agency's governing body, which shall schedule a public hearing within 45 days of the filing of the appeal, or any longer period mutually agreed upon by the operator and the governing body.

(6) Unless review of an interim management plan is pending before the lead agency, or an appeal is pending before the lead agency's governing body, a surface mining operation which remains idle for over one year after becoming idle as defined in Section 2727.1 without obtaining approval of an interim management plan shall be considered abandoned and the operator shall commence and complete reclamation in accordance with the approved reclamation plan.

(i) Any enforcement action which may be brought against a surface mining operation for operating without an approved reclamation plan, financial assurance, or interim management plan, shall be held in abeyance pending review pursuant to subdivision (b), (c), (d), or (h) or the resolution of an appeal filed with the board pursuant to subdivision (e), or with a lead agency governing body pursuant to subdivision (h).

§ 2770.5. Whenever surface mining operations are proposed in the 100-year flood plain for any stream, as shown in Zone A of Flood Insurance Rate Maps issued by the Federal Emergency Management Agency, and within one mile, upstream or downstream, of any state highway bridge, the lead

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agency receiving the application for the issuance or renewal of a permit to conduct the surface mining operations shall notify the Department of Transportation that the application has been received. The Department of Transportation shall have a period of not more than 45 days to review and comment on the proposed surface mining operations with respect to any potential damage to the state highway bridge from the proposed surface mining operations. The lead agency shall not issue or renew the permit until the Department of Transportation has submitted its comments or until 45 days from the date the application for the permit was submitted, whichever occurs first.

§ 2771. Whenever a proposed or existing surface mining operation is within the jurisdiction of two or more public agencies, is a permitted use within the agencies, and is not separated by a natural or manmade barrier coinciding with the boundary of the agencies, the evaluation of the proposed or existing operation shall be made by the lead agency in accordance with the procedures adopted by the lead agency pursuant to Section 2774. If a question arises as to which public agency is the lead agency, any affected public agency, or the affected operator, may submit the matter to the board. The board shall notify in writing all affected public agencies and operators that the matter has been submitted, specifying a date for a public hearing. The board shall designate the public agency which shall serve as the lead agency, giving due consideration to the capability of the agency to fulfill adequately the requirements of this chapter and to an examination of which of the public agencies has principal permit responsibility.

§ 2772. (a) The reclamation plan shall be filed with the lead agency, on a form provided by the lead agency, by any person who owns, leases, or otherwise controls or operates on all, or any portion of any, mined lands, and who plans to conduct surface mining operations on the lands.

(b) All documentation for the reclamation plan shall be submitted by the lead agency to the department at one time.

(c) The reclamation plan shall include all of the following information and documents:

(1) The name and address of the surface mining operator and the names and addresses of any persons designated by the operator as an agent for the service of process.

(2) The anticipated quantity and type of minerals for which the surface mining operation is to be conducted.

(3) The proposed dates for the initiation and termination of surface mining operation.

(4) The maximum anticipated depth of the surface mining operation.

(5) The size and legal description of the lands that will be affected by the surface mining operation, a map that includes the boundaries and topographic details of the lands, a description of the general geology of the area, a detailed description of the geology of the area in which surface mining is to be conducted, the location of all streams, roads, railroads, and utility facilities within, or adjacent to, the lands, the location of all proposed access roads to be constructed in conducting the surface mining operation, and the names and addresses of the owners of all surface interests and mineral interests in the lands.

(6) A description of, and a plan for, the type of surface mining to be employed, and a time schedule that will provide for the completion of surface mining on each segment of the mined lands so that reclamation can be initiated at the earliest possible time on those portions of the mined lands that will not be subject to further disturbance by the surface mining operation.

(7) A description of the proposed use or potential uses of the mined lands after reclamation and evidence that all owners of a possessory interest in the land have been notified of the proposed use or potential uses.

(8) A description of the manner in which reclamation, adequate for the proposed use or potential uses will be accomplished, including both of the following:

(A) A description of the manner in which contaminants will be controlled, and mining waste will be disposed.

(B) A description of the manner in which affected streambed channels and streambanks will be rehabilitated to a condition minimizing erosion and sedimentation will occur.

(9) An assessment of the effect of implementation of the reclamation plan on future mining in the area.

(10) A statement that the person submitting the reclamation plan accepts responsibility for reclaiming the mined lands in accordance with the reclamation plan.

(11) Any other information which the lead agency may require by ordinance.

(d) An item of information or a document required pursuant to subdivision (c) that has already been prepared as part of a permit application for the surface mining operation, or as part of an

environmental document prepared for the project pursuant to Division 13 (commencing with Section 21000), may be included in the reclamation plan by reference, if that item of information or that document is attached to the reclamation plan when the lead agency submits the reclamation plan to the director for review. To the extent that the information or document referenced in the reclamation plan is used to meet the requirements of subdivision (c), the information or document shall become part of the reclamation plan and shall be subject to all other requirements of this article.

(e) Nothing in this section is intended to limit or expand the department's authority or responsibility to review a document in accordance with Division 13 (commencing with Section 21000).

§ 2773. (a) The reclamation plan shall be applicable to a specific piece of property or properties, shall be based upon the character of the surrounding area and such characteristics of the property as type of overburden, soil stability, topography, geology, climate, stream characteristics, and principal mineral commodities, and shall establish site-specific criteria for evaluating compliance with the approved reclamation plan, including topography, revegetation and sediment, and erosion control.

(b) By January 1, 1992, the board shall adopt regulations specifying minimum, verifiable statewide reclamation standards. Subjects for which standards shall be set include, but shall not be limited to, the following:

(1) Wildlife habitat.

(2) Backfilling, regrading, slope stability, and recontouring.

(3) Revegetation.

(4) Drainage, diversion structures, waterways, and erosion control.

(5) Prime and other agricultural land reclamation.

(6) Building, structure, and equipment removal.

(7) Stream protection.

(8) Topsoil salvage, maintenance, and redistribution.

(9) Tailing and mine waste management.

These standards shall apply to each mining operation, but only to the extent that they are consistent with the planned or actual subsequent use or uses of the mining site.

§ 2773.1. (a) Lead agencies shall require financial assurances of each surface mining operation to ensure reclamation is performed in accordance with the surface mining operation's approved reclamation plan, as follows:

(1) Financial assurances may take the form of surety bonds, irrevocable letters of credit, trust funds, or other forms of financial assurances specified by the board pursuant to subdivision (e), which the lead agency reasonably determines are adequate to perform reclamation in accordance with the surface mining operation's approved reclamation plan.

(2) The financial assurances shall remain in effect for the duration of the surface mining operation and any additional period until reclamation is completed.

(3) The amount of financial assurances required of a surface mining operation for any one year shall be adjusted annually to account for new lands disturbed by surface mining operations, inflation, and reclamation of lands accomplished in accordance with the approved reclamation plan.

(4) The financial assurances shall be made payable to the lead agency and the department. Financial assurances that were approved by the lead agency prior to January 1, 1993, and were made payable to the State Geologist shall be considered payable to the department for purposes of this chapter. However, if a surface mining operation has received approval of its financial assurances from a public agency other than the lead agency, the lead agency shall deem those financial assurances adequate for purposes of this section, or shall credit them toward fulfillment of the financial assurances required by this section, if they are made payable to the public agency, the lead agency, and the department and otherwise meet the requirements of this section. In any event, if a lead agency and one or more public agencies exercise jurisdiction over a surface mining operation, the total amount of financial assurances required by the lead agency and the public agencies for any one year shall not exceed that amount which is necessary to perform reclamation of lands remaining disturbed. For purposes of this paragraph, a "public agency" may include a federal agency.

(b) If the lead agency or the board, following a public hearing, determines that the operator is financially incapable of performing reclamation in accordance with its approved reclamation plan, or has abandoned its surface mining operation without commencing reclamation, either the lead agency or the director shall do all of the following:

(1) Notify the operator by personal service or certified mail that the lead agency or the director intends to take appropriate action to forfeit the financial assurances and specify the reasons for so doing.

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(2) Allow the operator 60 days to commence or cause the commencement of reclamation in accordance with its approved reclamation plan and require that reclamation be completed within the time limits specified in the approved reclamation plan or some other time period mutually agreed upon by the lead agency or the director and the operator.

(3) Proceed to take appropriate action to require forfeiture of the financial assurances if the operator does not substantially comply with paragraph (2).

(4) Use the proceeds from the forfeited financial assurances to conduct and complete reclamation in accordance with the approved reclamation plan. In no event shall the financial assurances be used for any other purpose. The operator is responsible for the costs of conducting and completing reclamation in accordance with the approved reclamation plan which are in excess of the proceeds from the forfeited financial assurances.

(c) Financial assurances shall no longer be required of a surface mining operation, and shall be released, upon written notification by the lead agency, which shall be forwarded to the operator and the director, that reclamation has been completed in accordance with the approved reclamation plan. If a mining operation is sold or ownership is transferred to another person, the existing financial assurances shall remain in force and shall not be released by the lead agency until new financial assurances are secured from the new owner and have been approved by the lead agency in accordance with Section 2770.

(d) The lead agency shall have primary responsibility to seek forfeiture of financial assurances and to reclaim mine sites under subdivision (b). However, in cases where the board is not the lead agency pursuant to Section 2774.4, the director may act to seek forfeiture of financial assurances and reclaim mine sites pursuant to subdivision (b) only if both of the following occurs:

(1) The financial incapability of the operator or the abandonment of the mining operation has come to the attention of the director.

(2) The lead agency has been notified in writing by the director of the financial incapability of the operator or the abandonment of the mining operation for at least 15 days, and has not taken appropriate measures to seek forfeiture of the financial assurances and reclaim the mine site; and one of the following has occurred:

(A) The lead agency has been notified in writing by the director that failure to take appropriate measures to seek forfeiture of the financial assurances or to reclaim the mine site shall result in actions being taken against the lead agency under Section 2774.4.

(B) The director determines that there is a violation which amounts to an imminent and substantial endangerment to the public health, safety, or to the environment.

(C) The lead agency notifies the director in writing that its good faith attempts to seek forfeiture of the financial assurances have not been successful.

The director shall comply with subdivision (b) in seeking forfeiture of financial assurances and reclaiming mine sites.

(e) The board may adopt regulations specifying financial assurance mechanisms other than surety bonds, irrevocable letters of credit, and trust funds, which the board determines are reasonably available and adequate to ensure reclamation pursuant to this chapter, but these mechanisms may not include financial tests. These mechanisms may include reclamation bond pool programs.

(f) On or before March 1, 1993, the board shall adopt guidelines to implement this section. The guidelines are exempt from the requirements of Chapter 3.5 (commencing with Section 11340) of Part 1 of Division 3 of Title 2 of the Government Code, and are not subject to review by the Office of Administrative Law.

§ 2774. (a) Every lead agency shall adopt ordinances in accordance with state policy which establish procedures for the review and approval of reclamation plans and financial assurances and the issuance of a permit to conduct surface mining operations, except that any lead agency without an active surface mining operation in its jurisdiction may defer adopting an implementing ordinance until the filing of a permit application. The ordinances shall establish procedures requiring at least one public hearing and shall be periodically reviewed by the lead agency and revised, as necessary, to ensure that the ordinances continue to be in accordance with state policy.

(b) The lead agency shall conduct an inspection of a surface mining operation within six months of receipt by the lead agency of the surface mining operation's report submitted pursuant to Section 2207, solely to determine whether the surface mining operation is in compliance with this chapter. In no event shall a lead agency inspect a surface mining operation less than once in any calendar

year. The lead agency may cause such an inspection to be conducted by a state-registered geologist, state-registered civil engineer, state-licensed landscape architect, or state-registered forester, who is experienced in land reclamation and who has not been employed by the surface mining operation in any capacity during the previous 12 months. All inspections shall be conducted using a form developed by the department and approved by the board. The operator shall be solely responsible for the reasonable cost of the inspection. The lead agency shall notify the director within 30 days of the date of completion of the inspection that the inspection has been conducted. The notice shall contain a statement regarding the surface mining operation's compliance with this chapter, shall include a copy of the completed inspection form, and shall specify which aspects of the surface mining operations, if any, are inconsistent with this chapter. If the surface mining operation has a review of its reclamation plan, financial assurances, or an interim management plan pending under subdivision (b), (c), (d), or (h) of Section 2770, or an appeal pending before the board or lead agency governing body under subdivision (e) or (h) of Section 2770, the notice shall so indicate. The lead agency shall forward to the operator a copy of the notice, a copy of the completed inspection form, and any supporting documentation, including, but not limited to, any inspection report prepared by the geologist, civil engineer, landscape architect, or forester.

(c) Prior to approving a surface mining operation's reclamation plan, financial assurances, including existing financial assurances reviewed by the lead agency pursuant to subdivision (c) of Section 2770, or any amendments, the lead agency shall submit the plan, assurances, or amendments to the director for review. All documentation for that submission shall be submitted to the director at one time. When the lead agency submits a reclamation plan or plan amendments to the director for review, the lead agency shall also submit to the director, for use in reviewing the reclamation plan or plan amendments, information from any related document prepared, adopted, or certified pursuant to Division 13 (commencing with Section 21000), and shall submit any other pertinent information. The lead agency shall certify to the director that the reclamation plan is in compliance with the applicable requirements of Article 1 (commencing with Section 3500) of Chapter 8 of Division 2 of Title 14 of the California Code of Regulations in effect at the time that the reclamation plan is submitted to the director for review.

(d) (1) The director shall have 30 days from the date of receipt of a reclamation plan or plan amendments submitted pursuant to subdivision (c), and 45 days from the date of receipt of financial assurances submitted pursuant to subdivision (c), to prepare written comments, if the director so chooses. The lead agency shall evaluate any written comments received from the director relating to the reclamation plan, plan amendments, or financial assurances within a reasonable amount of time.

(2) The lead agency shall prepare a written response to the director's comments describing the disposition of the major issues raised. In particular, if the lead agency's position is at variance with any of the recommendations made, or objections raised, in the director's comments, the written response shall address, in detail, why specific comments and suggestions were not accepted. Copies of any written comments received and responses prepared by the lead agency shall be forwarded to the operator.

(3) To the extent that there is a conflict between the comments of a trustee agency or a responsible agency that are based on the agency's statutory or regulatory authority and the comments of other commenting agencies which are received by the lead agency pursuant to Division 13 (commencing with Section 21000) regarding a reclamation plan or plan amendments, the lead agency shall consider only the comments of the trustee agency or responsible agency.

(e) Lead agencies shall notify the director of the filing of an application for a permit to conduct surface mining operations within 30 days of such an application being filed with the lead agency. By July 1, 1991, each lead agency shall submit to the director for every active or idle mining operation within its jurisdiction, a copy of the mining permit required pursuant to Section 2774, and any conditions or amendments to those permits. By July 1 of each subsequent year, the lead agency shall submit to the director for each active or idle mining operation a copy of any permit or reclamation plan amendments, as applicable, or a statement that there have been no changes during the previous year. Failure to file with the director the information required under this section shall be cause for action under Section 2774.4.

§ 2774.1. (a) Except as provided in subdivision (i) of Section 2770, if the lead agency or the director determines, based upon an annual inspection

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pursuant to Section 2774, or otherwise confirmed by an inspection of the mining operation, that a surface mining operation is not in compliance with this chapter, the lead agency or the director may notify the operator of that violation by personal service or certified mail. If the violation extends beyond 30 days after the date of the lead agency's or the director's notification, the lead agency or the director may issue an order by personal service or certified mail requiring the operator to comply with this chapter or, if the operator does not have an approved reclamation plan or financial assurances, cease all further mining activities.

(b) An order issued under subdivision (a) shall not take effect until the operator has been provided a hearing before the lead agency for orders issued by the lead agency, or board for orders issued by the director, concerning the alleged violation. Any order issued under subdivision (a) shall specify which aspects of the surface mine's activities or operations are inconsistent with this chapter, shall specify a time for compliance which the lead agency or director determines is reasonable, taking into account the seriousness of the violation and any good faith efforts to comply with applicable requirements, and shall set a date for the hearing, which shall not be sooner than 30 days after the date of the order.

(c) Any operator who violates or fails to comply with an order issued under subdivision (a) after the order's effective date, as provided in subdivision (b), or who fails to submit a report to the director or lead agency as required by Section 2207, shall be subject to an order by the lead agency or the director imposing an administrative penalty of not more than five thousand dollars ($5,000) per day, assessed from the original date of noncompliance with this chapter or Section 2207. The penalty may be imposed administratively by the lead agency or the director. In determining the amount of the administrative penalty, the lead agency or the director shall take into consideration the nature, circumstances, extent, and gravity of the violation or violations, any prior history of violations, the degree of culpability, economic savings, if any, resulting from the violation, and any other matters justice may require. Orders setting administrative penalties shall become effective upon issuance thereof and payment shall be made to the lead agency or the director within 30 days, unless the operator petitions the legislative body of the lead agency, the board, or the superior court for review as provided in Section 2774.2. Any order shall be served by personal service or by certified mail upon the operator. Penalties collected by the director shall be used for no purpose other than to cover the reasonable costs incurred by the director in implementing this chapter or Section 2207.

(d) If the lead agency or the director determines that the surface mine is not in compliance with this chapter, so that the surface mine presents an imminent and substantial endangerment to the public health or the environment, the lead agency or the Attorney General, on behalf of the director, may seek an order from a court of competent jurisdiction enjoining that operation.

(e) Upon a complaint by the director, the department, or the board, the Attorney General may bring an action to recover administrative penalties under this section, and penalties under Section 2207, in any court of competent jurisdiction in this state against any person violating any provision of this chapter or Section 2207, or any regulation adopted pursuant to this chapter or Section 2207. The Attorney General may bring such an action on his or her own initiative if, after examining the complaint and the evidence, he or she believes a violation has occurred. The Attorney General may also seek an order from a court of competent jurisdiction compelling the operator to comply with this chapter and Section 2207.

(f) The lead agency has primary responsibility for enforcing this chapter and Section 2207. In cases where the board is not the lead agency pursuant to Section 2774.4, enforcement actions may be initiated by the director pursuant to this section only after the violation has come to the attention of the director and either of the following occurs:

(1) The lead agency has been notified by the director in writing of the violation for at least 15 days, and has not taken appropriate enforcement action.

(2) The director determines that there is a violation which amounts to an imminent and substantial endangerment to the public health or safety, or to the environment.

The director shall comply with this section in initiating enforcement actions.

(g) Remedies under this section are in addition to, and do not supersede or limit, any and all other remedies, civil or criminal.

§ 2774.2. (a) Within 30 days of the issuance of an order setting administrative penalties under subdivision (c) of Section 2774.1, the operator may petition that legislative body of the lead agency, if the lead agency has issued the order, or the board for orders issued by the director, for review of the

order. If the operator does not petition for review within the time limits set by this subdivision, the order setting administrative penalties shall not be subject to review by any court or agency.

(b) The legislative body of the lead agency or the board shall notify the operator by personal service or certified mail whether it will review the order setting administrative penalties. In reviewing an order pursuant to this section, the record shall consist of the record before the lead agency or the director, and any other relevant evidence which, in the judgment of the legislative body or the board, should be considered to effectuate and implement the policies of this chapter.

(c) The legislative body or the board may affirm, modify, or set aside, in whole or in part, by its own order, any order of the lead agency or the director setting administrative penalties reviewed by the legislative body or the board pursuant to this section.

(d) Any order of the legislative body or the board issued under subdivision (c) shall become effective upon issuance thereof, unless the operator petitions the superior court for review as provided in subdivision (e). Any order shall be served by personal service or by certified mail upon the operator. Payment of any administrative penalty which is specified in an order issued under subdivision (c), shall be made to the lead agency or the director within 30 days of service of the order; however, the payment shall be held in an interest bearing impound account pending the resolution of a petition for review filed pursuant to subdivision (e).

(e) Any operator aggrieved by an order of the legislative body or the board issued under subdivision (c) may obtain review of the order by filing in the superior court a petition for writ of mandate within 30 days following the issuance of the order. Any operator aggrieved by an order of a lead agency or the director setting administrative penalties under subdivision (c) of Section 2774.1, for which the legislative body or board denies review, may obtain review of the order in the superior court by filing in the court a petition for writ of mandate within 30 days following the denial of review. The provisions of Section 1094.5 of the Code of Civil Procedure shall govern judicial proceedings pursuant to this subdivision, except that in every case the court shall exercise its independent judgment. If the operator does not petition for a writ of mandate within the time limits set by this subdivision, an order of the board or the legislative body shall not be subject to review by any court or agency.

§ 2774.3. The board shall review lead agency ordinances which establish permit and reclamation procedures to determine whether each ordinance is in accordance with state policy, and shall certify the ordinance as being in accordance with state policy if it adequately meets, or imposes requirements more stringent than, the California surface mining and reclamation policies and procedures established by the board pursuant to this chapter.

§ 2774.4. (a) If the board finds that a lead agency either has (1) approved reclamation plans or financial assurances which are not consistent with this chapter, (2) failed to inspect or cause the inspection of surface mining operations as required by this chapter, (3) failed to seek forfeiture of financial assurances and to carry out reclamation of surface mining operations as required by this chapter, (4) failed to take appropriate enforcement actions as required by this chapter, (5) intentionally misrepresented the results of inspections required under this chapter, or (6) failed to submit information to the department as required by this chapter, the board shall exercise any of the powers of that lead agency under this chapter, except for permitting authority.

(b) If, no sooner than three years after the board has taken action pursuant to subdivision (a), the board finds, after a public hearing, that a lead agency has corrected its deficiencies in implementing and enforcing this chapter, and the rules and regulations adopted pursuant to this chapter, the board shall restore to the lead agency the powers assumed by the board pursuant to subdivision (a).

(c) Before taking any action pursuant to subdivision (a), the board shall first notify the lead agency of the identified deficiencies, and allows the lead agency 45 days to correct the deficiencies to the satisfaction of the board. If the lead agency has not corrected the deficiencies to the satisfaction of the board within the 45-day period, the board shall hold a public hearing within the lead agency's area of jurisdiction, upon a 45-day written notice given to the public in at least one newspaper of general circulation within the city or county, and directly mailed to the lead agency and to all surface mining operators within the lead agency's jurisdiction who have submitted reports as required by Section 2207.

(d) Affected surface mining operators and interested persons have the right, at the public hearing, to present oral and written evidence on the

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matter being considered. The board may, at the public hearing, place reasonable limits on the right of affected surface mining operators and interested persons to question and solicit testimony.

(e) If, after conducting the public hearing required by subdivision (c), the board decides to take action pursuant to subdivision (a) the board shall, based on the record of the public hearing, adopt written findings which explain all of the following:

(1) The action to be taken by the board.

(2) Why the board decided to take the action.

(3) Why the action is authorized by, and meets the requirements of, subdivision (a).

In addition, the findings shall address the significant issues raised, or written evidence presented, by affected surface mining operators, interested persons, or the lead agency. The transcript of testimony and exhibits, together with all papers and requests filed in the proceedings, shall constitute the exclusive record for decision by the board.

(f) The lead agency, any affected surface mining operator, or any interested person who has presented oral or written evidence at the public hearing before the board pursuant to subdivision (d) may obtain review of the board's action taken pursuant to subdivision (a) by filing in the superior court a petition for writ of mandate within 30 days following the issuance of the board's decision. Section 1094.5 of the Code of Civil Procedure governs judicial proceedings pursuant to this subdivision, except that in every case the court shall exercise its independent judgment. If a petition for a writ of mandate is not filed within the time limits set by this subdivision, the board's action under subdivision (a) shall not be subject to review by any court or agency.

§ 2774.5. (a) If, upon review of an ordinance, the board finds that it is not in accordance with state policy, the board shall communicate the ordinance's deficiencies in writing to the lead agency. Upon receipt of the written communication, the lead agency shall have 90 days to submit a revised ordinance to the board for certification as being in accordance with state policy. The board shall review the lead agency's revised ordinance for certification within 60 days of its receipt. If the lead agency does not submit a revised ordinance within 90 days, the board shall assume full authority for reviewing and approving reclamation plans submitted to the lead agency until the time the lead agency's ordinances are revised in accordance with state policy.

(b) If, upon review of a lead agency's revised ordinance, the board finds the ordinance is still not in accordance with state policy, the board shall again communicate the ordinance's deficiencies in writing to the lead agency. The lead agency shall have a second 90-day period in which to revise the ordinance and submit it to the board for review. If the board again finds that the revised ordinance is not in accordance with state policy or if no revision is submitted, the board shall assume full authority for reviewing and approving reclamation plans submitted to the lead agency until the time the lead agency's ordinances are revised in accordance with state policy.

(c) In any jurisdiction in which the lead agency does not have a certified ordinance, no person shall initiate a surface mining operation unless a reclamation plan has been submitted to, and approved by, the board. Any reclamation plan, approved by a lead agency under the lead agency's ordinance which was not in accordance with state policy at the time of approval, shall be subject to amendment by the board or under the ordinance certified by the board as being in accordance with state policy.

(d) Reclamation plans approved by the board pursuant to this section shall not be subject to modification by the lead agency at a future date but may be amended by the board. Reclamation plans approved by the board shall be remanded to the lead agency upon certification of the lead agency's ordinance, and the lead agency shall approve the reclamation plan as approved by the board, except that a subsequent amendment as may be agreed upon between the operator and the lead agency may be made according to this chapter. No additional public hearing shall be required prior to the lead agency's approval. Nothing in this section shall be construed as authorizing the board to issue a permit for the conduct of mining operations.

§ 2774.6. (a) On or before March 1, 1995, the department shall submit to the Governor and the Legislature a report, prepared by a qualified consultant, which may include an educational institution, which evaluates the effectiveness of lead agencies and the department in implementing this chapter and Section 2207, and in meeting the intent of the Legislature as set forth in Section 2712. The report shall be prepared to the extent that funds are appropriated by the Legislature for this purpose. Prior to encumbering any funds for preparation of the report, the board may conduct a public hearing to receive and respond to public comments concerning the scope of issues to be addressed.

(b) The report shall include, but is not limited to, an evaluation of all of the following:

(1) Compliance with this chapter and Section 2207 by operators of surface mines, lead agencies, the State Geologist, the department, and the board.

(2) Compliance with the reclamation requirements prescribed in Section 2773.

(3) The adequacy of resources needed to carry out this chapter and Section 2207.

(4) The adequacy of information available for purposes of preparing the report.

(5) Any recommended changes to administrative regulations or recommendations for further legislation.

§ 2775. (a) An applicant whose request for a permit to conduct surface mining operations in an area of statewide or regional significance has been denied by a lead agency, or any person who is aggrieved by the granting of a permit to conduct surface mining operations in an area of statewide or regional significance, may, within 15 days of exhausting his rights to appeal in accordance with the procedures of the lead agency, appeal to the board.

(b) The board may, by regulation, establish procedures for declining to hear appeals that it determines raise no substantial issues.

(c) Appeals that the board does not decline to hear shall be scheduled and heard at a public hearing held within the jurisdiction of the lead agency which processed the original application within 30 days of the filing of the appeal, or such longer period as may be mutually agreed upon by the board and the person filing the appeal. In any such action, the board shall not exercise its independent judgment on the evidence but shall only determine whether the decision of the lead agency is supported by substantial evidence in the light of the whole record. If the board determines the decision of the lead agency is not supported by substantial evidence in the light of the whole record it shall remand the appeal to the lead agency and the lead agency shall schedule a public hearing to reconsider its action.

§ 2776. No person who has obtained a vested right to conduct surface mining operations prior to January 1, 1976, shall be required to secure a permit pursuant to this chapter as long as the vested right continues and as long as no substantial changes are made in the operation except in accordance with this chapter. A person shall be deemed to have vested rights if, prior to January 1, 1976, he or she has, in good faith and in reliance upon a permit or other authorization, if the permit or other authorization was required, diligently commenced surface mining operations and incurred substantial liabilities for work and materials necessary therefor. Expenses incurred in obtaining the enactment of an ordinance in relation to a particular operation or the issuance of a permit shall not be deemed liabilities for work or materials.

The reclamation plan required to be filed under subdivision (b) of Section 2770, shall apply to operations conducted after January 1, 1976, or to be conducted.

Nothing in this chapter shall be construed as requiring the filing of a reclamation plan for, or the reclamation of, mined lands on which surface mining operations were conducted prior to January 1, 1976.

§ 2777. Amendments to an approved reclamation plan may be submitted detailing proposed changes from the original plan. Substantial deviations from the original plan shall not be undertaken until such amendment has been filed with, and approved by, the lead agency.

§ 2778. (a) Reclamation plans, reports, applications, and other documents submitted pursuant to this chapter are public records, unless it can be demonstrated to the satisfaction of the lead agency that the release of that information, or part thereof, would reveal production, reserves, or rate of depletion entitled to protection as proprietary information. The lead agency shall identify such proprietary information as a separate part of the application. Proprietary information shall be made available only to the director and to persons authorized in writing by the operator and by the owner.

(b) A copy of all reclamation plans, reports, applications, and other documents submitted pursuant to this chapter shall be furnished to the director by lead agencies on request.

§ 2779. Whenever one operator succeeds to the interest of another in any incompleted surface mining operation by sale, assignment, transfer, conveyance, exchange, or other means, the successor shall be bound by the provisions of the approved reclamation plan and the provisions of this chapter.

Article 6. Areas of Statewide or Regional Significance

§ 2790. After receipt of mineral information from the State Geologist pursuant to subdivision (c) of Section 2761, the board may by regulation

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adopted after a public hearing designate specific geographic areas of the state as areas of statewide or regional significance and specify the boundaries thereof. Such designation shall be included as a part of the state policy and shall indicate the reason for which the particular area designated is of significance to the state or region, the adverse effects that might result from premature development of incompatible land uses, the advantages that might be achieved from extraction of the minerals of the area, and the specific goals and policies to protect against the premature incompatible development of the area.

§ 2791. The board shall seek the recommendations of concerned federal, state, and local agencies, educational institutions, civic and public interest organizations, and private organizations and individuals in the identification of areas of statewide and regional significance.

§ 2792. Neither the designation of an area of regional or statewide significance nor the adoption of any regulations for such an area shall in any way limit or modify the rights of any person to complete any development that has been authorized pursuant to Part 2 (commencing with Section 11000) of Division 4 of the Business and Professions Code, pursuant to the Subdivision Map Act (Division 2 [commencing with Section 66410] of Title 7 of the Government Code), or by a building permit or other authorization to commence development, upon which such person relies and has changed his position to his substantial detriment, and, which permit or authorization was issued prior to the designation of such area pursuant to Section 2790. If a developer has by his actions taken in reliance upon prior regulations obtained vested or other legal rights that in law would have prevented a local public agency from changing such regulations in a way adverse to his interests, nothing in this chapter authorizes any governmental agency to abridge those rights.

§ 2793. The board may, by regulation adopted after a public hearing, terminate, partially or wholly, the designation of any area of statewide or regional significance on a finding that the direct involvement of the board is no longer required.

Article 7. Fiscal Provisions

§ 2795. (a) Notwithstanding any other provision of law, the first two million dollars ($2,000,000) of moneys from mining activities on federal lands disbursed by the United States each fiscal year to this state pursuant to Section 35 of the Mineral Lands Leasing Act, as amended (30 U.S.C. Sec. 191), shall be deposited in the Surface Mining and Reclamation Account in the General Fund, which account is hereby created, and may be expended, upon appropriation by the Legislature, for the purposes of this chapter. However, if in any fiscal year, the amount of money disbursed to the state pursuant to Section 35 of the Mineral Lands Leasing Act is less than twenty million dollars ($20,000,000), then only the first one million one hundred thousand dollars ($1,100,000) of that money shall be deposited in the Surface Mining and Reclamation Account for the next fiscal year.

(b) Proposed expenditures from the account shall be included in a separate item in the Budget Bill for each fiscal year for consideration by the Legislature. Each appropriation from the account shall be subject to all of the limitations contained in the Budget Act and to all other fiscal procedures prescribed by law with respect to the expenditure of state funds.

§ 2796. (a) The Legislature hereby establishes a state abandoned minerals and mineral materials mine reclamation program for the purpose of administering funds received by the state under the Surface Mining Control and Reclamation Act of 1977, or through amendments to the federal general mining laws (30 U.S.C. Secs. 1, 12A, 16, 161, and 162, and 602, et seq.).

(b) There is hereby created in the State Treasury, the Abandoned Mine Reclamation and Minerals Fund. The money in the fund may be expended, upon appropriation by the Legislature, as required by federal legislation amending the federal general mining laws, and for the following purposes:

(1) Development of an inventory of mined lands, water, and facilities eligible for reclamation.

(2) Establishment by the director of the abandoned minerals and mineral materials mine reclamation program pursuant to the pending federal legislation amending the federal general mining laws, if enacted, that provides for all of the following:

(A) (i) Reclamation and restoration of abandoned surface mined areas.

(ii) For purposes of this subparagraph, "abandoned surface mined area" means mined lands that meet all of the following requirements:

(I) Mining operations have ceased for a period of one year or more.

(II) There is no interim management plan in effect that meets the requirements of Section 2770.

(III) There are no approved financial assurances that are adequate to perform reclamation in accordance with this chapter.

(IV) The mined lands are adversely affected by past mineral mining, other than mining for coal, oil, and gas, and mineral material mining.

(B) Reclamation and restoration of abandoned milling and processing areas.

(C) Sealing, filling, and grading abandoned deep mine entries.

(D) Planting of land adversely affected by past mining to prevent erosion and sedimentation.

(E) Prevention, abatement, treatment, and control of water pollution created by abandoned mine drainage.

(F) Control of surface subsidence due to abandoned deep mines.

(G) The expenses necessary to accomplish the purposes of this section.

(3) To the extent those expenditures are allowed by the applicable statutes:

(A) Grants to lead agencies for the purposes of carrying out this chapter.

(B) Implementation of this chapter and Section 2207 by the department, which may include an offsetting reduction in the amount of reporting fees collected from each active and idle mining operation and deposited in the Mine Reclamation Account pursuant to subdivision (d) of the Section 2207, as determined by the director.

(c) The Abandoned Mine Reclamation and Minerals Fund shall be the depository for all moneys from mining activities on federal lands, as follows:

(1) (A) Disbursements made by the United States each fiscal year to this state pursuant to Section 35 of the Mineral Lands Leasing Act (30 U.S.C. Sec. 191), with respect to royalties levied on the production of locatable minerals or mineral concentrates from any mining claim located on federal lands in the state pursuant to the pending federal legislation amending the federal general mining laws, but excluding oil, gas, and geothermal revenues.

(B) The federal funds specified in this paragraph do not include the funds deposited in the Surface Mining and Reclamation Account pursuant to Section 2795, the funds deposited in the Geothermal Resources Development Account pursuant to Section 3820, or the funds deposited in the State School Fund pursuant to Section 12320 of the Education Code.

(2) Grants made by the Secretary of the Interior to this state from the Abandoned Minerals Mine Reclamation Fund pursuant to the pending federal legislation amending the federal general mining laws, for the implementation of an abandoned minerals and mining materials mine reclamation program.

(d) The expenditure of money from the Abandoned Mine Reclamation and Minerals Fund shall reflect the
following priorities and other priorities as specified in federal statute in the following ranking:

(1) The protection of public health and safety and the environment from the adverse effects of past minerals and mineral materials mining practices.

(2) The protection of property that is in extreme danger as a result of past minerals and mineral materials mining practices.

(3) The restoration of land and water resources previously degraded by the adverse effects of past minerals and mineral materials mining practices.

(e) Proposed expenditures from the Abandoned Mine Reclamation and Minerals Fund shall be included in a separate item in the Budget Bill for each fiscal year for consideration by the Legislature. Each appropriation from the fund shall be subject to all the limitations contained in the Budget Act and to all other fiscal procedures prescribed by law with respect to the expenditure of state funds.

NOTE: Section 2796 shall become operative upon the effective date of any federal legislation which is enacted requiring the payment of a royalty on the production of locatable minerals, produced from any mining claim located or converted on federal lands in this state, excluding royalties paid on oil, gas, and geothermal lease activities, and not already subject to disposition under any of the following:

(1) The Mineral Lands Leasing Act
(30 U.S.C. Sec. 191).

(2) The Geothermal Steam Act of 1970
(30 U.S.C. Sec. 100).

(3) The Materials Act of 1947
(30 U.S.C. Sec. 601).

(4) The Mineral Leasing Act for Acquired Lands
(30 U.S.C. Sec. 351).

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ANNUAL REPORTING REQUIREMENTS AND REPORTING FEE

Public Resources Code Section 2207
(Repealed and added by AB 3551, Chapter 1097, Statutes of 1990, Sher,
Amended by AB 3903, Chapter 1101, Statutes of 1990, Sher, AB 1506, Chapter 845,
Statutes of 1991, Sher, AB 3098, Chapter 1077, Statutes of 1992, Sher, and
SB 741, Chapter 1287, Statutes of 1993, Rogers)

§ 2207(a) The owner, lessor, lessee, agent, manager, or other person in charge of any mining operation of whatever kind or character within the state shall forward to the director not later than July 1, 1991, and every year thereafter not later than an anniversary date established by the director, upon forms which will be furnished by the board, a report which identifies all of the following:

(1) The name, address, and telephone number of the person, company, or other owner of the mining operation.

(2) The name, address, and telephone number of a designated agent who resides in this state, and who will receive and accept service of all orders, notices, and processes of the lead agency, board, director, or court.

(3) The location of the mining operation, its name, its mine number as issued by the Bureau of Mines or the director, its section, township, range, latitude, longitude, and approximate boundaries of the mining operation marked on a United States Geological Survey 7½-minute or 15-minute quadrangle map.

(4) The lead agency.

(5) The approval date of the mining operation's reclamation plan.

(6) The mining operation's status as active, idle, reclaimed, or in the process of being reclaimed.

(7) The commodities produced by the mine and the type of mining operation.

(8) Proof of annual inspection by the lead agency, starting with the 1992 report.

(9) Proof of financial assurances.

(10) Ownership of the property, including government agencies, if applicable, by the assessor's parcel number, and total assessed value of the mining operation.

(11) The approximate permitted size of the mining operation subject to Chapter 9 (commencing with Section 2710), in acres.

(12) The approximate total acreage of land newly disturbed by the mining operation during the previous calendar year.

(13) The approximate total of disturbed acreage reclaimed during the previous calendar year.

(14) The approximate total unreclaimed disturbed acreage remaining as of the end of the calendar year.

(15) The total production for each mineral commodity produced during the previous year.

(16) A copy of any approved reclamation plan and any amendments or conditions of approval to any existing reclamation plan approved by the lead agency.

(b) Every year, not later than the anniversary date established by the director, the person submitting the report pursuant to subdivision (a) shall forward to the lead agency, upon forms which shall be furnished by the board, a report which provides all of the information specified in paragraphs (1) to (14), inclusive, of subdivision (a).

(c) Subsequent reports shall include only changes in the information submitted for the items described in subdivision (a), except that, instead of the approved reclamation plan, the reports shall include any reclamation plan amendments approved during the previous year. The reports shall state whether review of a reclamation plan, financial assurances, or an interim management plan is pending under subdivision (b), (c), (d), or (h) of Section 2770, or whether an appeal before the board or lead agency governing body is pending under subdivision (e) or (h) of Section 2770. The director shall notify the person submitting the report and the owner's designated agent in writing that the report and the fee required pursuant to subdivision (d) have been received, specify the anniversary date by which the mining operation shall submit reports, specify the mining operation's mine number if one has not been issued by the Bureau of Mines, and notify the person and agent of any deficiencies in the report within 90 days of receipt. That person or agent shall have 30 days from receipt of the notification to correct the noted deficiencies and forward the revised reports to the director and the

lead agency. Any person who fails to comply with this section, or knowingly provides incorrect or false information in reports required by this section, may be subject to an administrative penalty as provided in subdivision (c) of Section 2774.1.

(d) (1) The board shall impose, by regulation, pursuant to paragraph (2), an annual reporting fee on, and method for collecting annual fees from, each active or idle mining operation. The maximum fee for any single mining operation shall not exceed two thousand dollars ($2,000) annually and shall not be less than fifty dollars ($50) annually.

(2) (A) The board shall adopt, by regulation, a schedule of fees authorized under paragraph (1) to cover the department's cost in carrying out this section and Chapter 9 (commencing with Section 2710), as reflected in the Governor's Budget, and may adopt those regulations as emergency regulations. In establishing the schedule of fees to be paid by each active and idle mining operation, the fees shall be calculated on an equitable basis reflecting the size and type of operation. The board shall also consider the total assessed value of the mining operation, the acreage disturbed by mining activities, and the acreage subject to the reclamation plan.

(B) Regulations adopted pursuant to this subdivision shall be adopted by the board in accordance with Chapter 3.5 (commencing with Section 11340) of Part 1 of Division 3 of Title 2 of the Government Code. The adoption of any emergency regulations pursuant to this subdivision shall be considered necessary to address an emergency and shall be considered by the Office of Administrative Law to be necessary for the immediate preservation of the public peace, health, safety, and general welfare.

(3) For the 1991-92 fiscal year the total revenue generated by the reporting fees established pursuant to this subdivision shall not exceed, and may be less than, one million one hundred thirty-two thousand dollars ($1,132,000), which shall be adjusted in the 1992-93 and 1993-94 fiscal years to reflect increases in the cost of living, as measured by the California Consumer Price Index for all urban consumers, calendar year averages, using the percentage change in the previous year. Beginning in the 1994-95 fiscal year, and for subsequent fiscal years the total revenue generated by the reporting fees shall not exceed, and may be less than, the amount of one million dollars ($1,000,000), as adjusted for the cost of living beginning with the 1991-92 fiscal year and annually thereafter. If the director determines that the revenue collected during the preceding fiscal year was greater or less than the cost to operate the program, the board shall adjust the fees to compensate for the overcollection or undercollection of revenues.

(4) The reporting fees established pursuant to this subdivision shall be deposited in the Mine Reclamation Account, which is hereby created. Any fees, penalties, interest, fines, or charges collected by the director or board pursuant to this chapter or Chapter 9 (commencing with Section 2710) shall be deposited in the Mine Reclamation Account. The money in the account shall be available to the department and board, upon appropriation by the Legislature, solely to carry out this section and Chapter 9 (commencing with Section 2710), and up to three hundred thousand dollars ($300,000) shall be available to the department upon appropriation by the Legislature to contract for preparation of the report required by Section 2774.6

(5) In case of late payment of the reporting fee, a penalty of not less than one hundred dollars ($100) or 10 percent of the amount due, whichever is greater, plus interest at the rate of 1 ½ percent per month, computed from the delinquent date of the assessment until and including the date of payment, shall be assessed. New mining operations which have not submitted a report shall submit a report prior to commencement of operations. The new operation shall submit its fee according to the reasonable fee schedule adopted by the board, and the month that the report is received shall become that operation's anniversary month.

(e) The lead agency may impose a fee upon each mining operation to cover the reasonable costs incurred in implementing this chapter and Chapter 9 (commencing with Section 2710) .

(f) For purposes of this section, "mining operation" has the same meaning as "surface mining operation" as defined in Section 2735, unless excepted by Section 2714. For the purposes of fee collections only, "mining operation" may include one or more mines operated by a single operator or mining company on one or more sites, if the total annual combined mineral production for all sites is less than 100 troy ounces for precious metals, if precious metals are the primary mineral commodity produced, or less than 100,000 short tons if the primary mineral commodity produced is not precious metals.

(g) Any information in reports submitted pursuant to subdivision (a) which includes or otherwise indicates the total mineral production,

reserves, or rate of depletion of any mining operation shall not be disclosed to any member of the public, as defined in subdivision (f) of Section 6252 of the Government Code. Other portions of the reports are public records unless excepted by statute. Statistical bulletins based on these reports and published under Section 2205 shall be compiled to show, for the state as a whole and separately for each lead agency, the total of each mineral produced therein. In order not to disclose the production, reserves, or rate of depletion from any identifiable mining operation, no production figure shall be published or otherwise disclosed unless that figure is the aggregated production of not less than three mining operations. If the production figure for any lead agency would disclose the production, reserves, or rate of depletion of less than three mining operations or otherwise permit the reasonable inference of the production, reserves, or rate of depletion of any identifiable mining operation, that figure shall be combined with the same such figure of not less than two other lead agencies without regard to the location of the lead agencies. The bulletin shall be published annually by June 30 or as soon thereafter as practicable.

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SITE INSPECTIONS CONDUCTED BY THE DEPARTMENT OF CONSERVATION

Public Resources Code Section 2208
(Amended by AB 2943 [Allen, Chapter 999, Statutes of 1992])

§ 2208. The director or a qualified assistant may at any time enter or examine any and all mines, quarries, wells, mills, reduction works, refining works, and other mineral properties or working plants in this state in order to gather data to comply with the provisions of this chapter.

PURCHASE AND USE OF MINED MATERIALS BY STATE AGENCIES

Public Contract Code Section 10295.5
(Amended by AB 3098 [Sher, Chapter 1077, Statutes of 1992]
and AB 723 [Sher, Chapter 278, Statutes of 1993])

10295.5 (a) Notwithstanding any other provision of law, no state agency shall purchase or utilize sand, gravel, aggregates, or other minerals produced from a surface mining operation subject to the Surface Mining and Reclamation Act of 1975 (Chapter 9 (commencing with Section 2710) of Division 2 of the Public Resources Code), unless the operation is identified in the list published pursuant to subdivision (b) of Section 2717 of the Public Resources Code as having either of the following:

(1) An approved reclamation plan and financial assurances covering the affected surface mining operation.

(2) An appeal pending before the State Mining and Geology Board pursuant to subdivision (e) of Section 2770 of the Public Resources Code with respect to the reclamation plan or financial assurances.

(b) The Department of General Services shall revise its procedures and procurement specifications for state purchases of sand, gravel, aggregates, and other minerals to ensure maximum compliance with this section.

(c) For purposes of the section, "minerals" means any naturally occurring chemical element or compound, or groups of elements and compounds, formed from inorganic processes and organic substances, including, but not limited to, coal, peat, and bituminous rock, but excluding geothermal resources, natural gas, and petroleum.

(d) The requirements of this section shall apply to mining operations on federal lands or Indian lands that are subject to the Surface Mining and Reclamation Act of 1975 (Chapter 9 (commencing with Section 2710) of Division 2 of the Public Resources Code) pursuant to a memorandum of understanding between the Department of Conservation and the federal agency having jurisdiction over the lands.

(e)(1) This section does not apply to construction or maintenance contracts if the contractor has entered into a written subcontract, executed prior to July 1, 1993, for the purchase of materials from a mine operator that would not otherwise qualify under the list published pursuant to subdivision (b) of Section 2717 of the Public Resources Code.

(2) This subdivision shall become inoperative on July 1, 1996.

(f) This section shall become operative on July 1, 1993.

LIABILITY LIMITATIONS FOR REMEDIATION/RECLAMATION OF ABANDONED MINES

See Water Code Section 13397 et seq.
(Added by SB 1108 [Leslie, Chapter 878, Statutes of 1995])

NOTE: While this section amends the California Water Code, liabilities under the federal Clean Water Act may remain until similar federal amendments are adopted.

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STATE MINING AND GEOLOGY BOARD RECLAMATION REGULATIONS

Article 1. Surface Mining and Reclamation Practice

§ 3500. Purpose. It is the purpose of this subchapter to establish state policy for the reclamation of mined lands and the conduct of surface mining operations in accord with the general provisions set forth in Public Resources Code, Division 2, Chapter 9, Section 2710 et seq. (Surface Mining and Reclamation Act of 1975, as amended by Statutes of 1980).

Note: Authority cited: Section 2755, Public Resources Code. Reference: Sections 2710-2795, Public Resources Code.

§ 3501. Definitions. The following definitions as used herein shall govern the interpretation of these regulations:

Agricultural Activity. The cultivation and tillage of the soil, dairying, the production, cultivation, growing and harvesting of any agricultural commodity, the raising of livestock or poultry, and any practices performed by a farmer or on a farm as incident to or in conjunction with those farming operations, including preparation of these products for market.

Angle of Repose. The maximum angle of slope (measured from horizontal plane) at which loose cohesionless material will come to rest on a pile of similar material.

Backfill. Earth, overburden, mine waste or imported material used to replace material removed during mining.

Borrow Pits. Excavations created by the surface mining of rock, unconsolidated geologic deposits or soil to provide material (borrow) for fill elsewhere.

Critical Gradient. The maximum stable inclination of an unsupported slope under the most adverse conditions that it will likely experience, as determined by current engineering technology.

Excavations for On-Site Construction. Earth material moving activities that are required to prepare a site for construction of structures, landscaping, or other land improvements (such as excavation, grading, compaction, and the creation of fills and embankments), or that in and of themselves constitute engineered works (such as dams, road cuts, fills, and catchment basins).

Grading. To bring an existing surface to a designed form by cutting, filling, and/or smoothing operations.

Minerals. Any naturally occurring chemical element or compound, or groups of elements and compounds, formed from inorganic processes and organic substances, including, but not limited to, coal, peat, and bituminous rock, but excluding geothermal resources, natural gas, and petroleum.

Person. Any individual, firm, association, corporation, organization, or partnership, or any city, county, district, or the state or any department or agency thereof.

Reclamation Plan. The applicant's (operator's) completed and approved plan for reclaiming the lands affected by his surface mining operations conducted after January 1, 1976, as called for in Section 2772 of the Act.

Resoiling. The process of artificially building or reconstructing a soil profile.

Stream Bed Skimming. Excavation of sand and gravel from stream bed deposits above the mean summer water level or stream bottom, whichever is higher.

Surface Mining Operations. In addition to the provisions of Section 2735 of the Act, borrow pitting, streambed skimming, segregation and stockpiling of mined materials (and recovery of same) are deemed to be surface mining operations unless specifically excluded under Section 2714 of the Act or Section 3505 of these regulations.

Temporarily Deactivated Operation. A surface mine that has been closed down and that the operator has maintained in the expectation of reopening it when the conditions justify.

Topsoil. The upper part of the soil profile that is relatively rich in humus, which is technically known as the A-horizon of the soil profile.

NOTE: Authority cited: Section 2755, Public Resources Code. Reference: Sections 2726-2735, Public Resources Code.

§ 3502. The Reclamation Plan.

(a) Objectives. Reclamation plans shall be developed to attain the objectives of Public Resources Code Section 2712(a)-(c).

(b) Reclamation Plan Elements. In addition to the information required by Public Resources Code

Section 2772, the following elements shall be included in the reclamation plan:

(1) The environmental setting of the site of operations and the effect that possible alternate reclaimed site conditions may have upon the existing and future uses of surrounding lands.

(2) The public health and safety, giving consideration to the degree and type of present and probable future exposure of the public to the site.

(3) The designed steepness and proposed treatment of the mined lands' final slopes shall take into consideration the physical properties of the slope material, its probable maximum water content, landscaping requirements, and other factors. In all cases, reclamation plans shall specify slope angles flatter than the critical gradient for the type of material involved. Whenever final slopes approach the critical gradient for the type of material involved, regulatory agencies shall require an engineering analysis of the slope stability. Special emphasis on slope stability and design shall be necessary when public safety or adjacent property may be affected.

(4) Areas mined to produce additional materials for backfilling and grading, as well as settlement of filled areas, shall be considered in the reclamation plan. Where ultimate site uses include roads, building sites, or other improvements sensitive to settlement, the reclamation plans shall include compaction of the fill materials in conformance with good engineering practice.

(5) Disposition of old equipment.

(6) Temporary stream or watershed diversions.

(c) Adequacy. In judging the adequacy of a particular reclamation plan in meeting the requirements described herein and within the Act, the lead agency shall consider the physical and land-use characteristics of the mined lands and their surrounding area pursuant to Public Resources Code Section 2773.

NOTE: Authority cited: Section 2755, Public Resources Code. Reference: Sections 2712(a)–(c), 2756-2757, 2770 and 2772-2773, Public Resources Code.

§ 3503. Surface Mining and Reclamation Practice.

The following are minimum acceptable practices to be followed in surface mining operations:

(a) Soil Erosion Control.

(1) The removal of vegetation and overburden, if any, in advance of surface mining shall be kept to the minimum.

(2) Stockpiles of overburden and minerals shall be managed to minimize water and wind erosion.

(3) Erosion control facilities such as retarding basins, ditches, streambank stabilization, and diking shall be constructed and maintained where necessary to control erosion.

(b) Water Quality and Watershed Control.

(1) Settling ponds or basins shall be constructed to prevent potential sedimentation of streams at operations where they will provide a significant benefit to water quality.

(2) Operations shall be conducted to substantially prevent siltation of ground-water recharge areas.

(c) Protection of Fish and Wildlife Habitat. All reasonable measures shall be taken to protect the habitat of fish and wildlife.

(d) Disposal of Mine Waste Rock and Overburden. Permanent piles or dumps of mine waste rock and overburden shall be stable and shall not restrict the natural drainage without suitable provisions for diversion.

(e) Erosion and Drainage. Grading and revegetation shall be designed to minimize erosion and to convey surface runoff to natural drainage courses or interior basins designed for water storage. Basins that will store water during periods of surface runoff shall be designed to prevent erosion of spillways when these basins have outlet to lower ground.

(f) Resoiling. When the reclamation plan calls for resoiling, coarse hard mine waste shall be leveled and covered with a layer of finer material or weathered waste. A soil layer shall then be placed on this prepared surface. Surface mines that did not salvage soil during their initial operations shall attempt, where feasible, to upgrade remaining materials. The use of soil conditioners, mulches, or imported topsoil shall be considered where revegetation is part of the reclamation plan and where such measures appear necessary. It is not justified, however, to denude adjacent areas of their soil, for any such denuded areas must in turn be reclaimed.

(g) Revegetation. When the reclamation plan calls for revegetation the available research addressing revegetation methods and the selection of species having good survival characteristics, for the topography, resoiling characteristics, and climate of the mined areas shall be used.

NOTE: Authority cited: Section 2755, Public Resources Code. Reference: Sections 2756 and 2757, Public Resources Code.

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§ 3504. Administration by Lead Agency.

(a) Record Keeping. The lead agency shall establish and maintain inhouse measures and procedures to ensure organized record-keeping and monitoring of surface mining reclamation under its jurisdiction. The lead agency shall forward a copy of each permit and approved reclamation plan to the California Division of Mines and Geology (Sacramento).

(b) Performance Assurances. The lead agency shall ensure that the objectives of the reclamation plan will be attained. This may include provisions for liens, surety bonds or other security, to guarantee the reclamation in accordance with the approved reclamation plan.

NOTE: Authority cited: Section 2755, Public Resources Code. Reference: Sections 2757, 2758(b), 2774(a) and 2778, Public Resources Code.

§ 3505. Special Provisions.

(a) Exemptions.

(1) In addition to the provisions of Public Resources Code Section 2714(a), (c) and (d), any surface mining operation that does not involve either the removal of a total of more than 1000 cubic yards of minerals, ores, and overburden, or involve more than one acre in any one location, shall be exempt from the provisions of the Act.

(2) The purpose of this subdivision is to define the criteria of a "flood control facility," the clean out of which is exempt from the requirements of the Surface Mining and Reclamation Act of 1975 under PRC 2714(a) and (b). It is intended that cleaning out of a previously engineered, constructed facility for which approved design plans exist is an activity to restore the usefulness of that flood control facility to its original design purpose. It is not the intent of this subsection to exempt the removal of materials from natural channels.

The removal of post construction accumulated materials from a responsible public agency approved, managed, engineered, constructed facility intended for the purpose of water retention or detention, debris retention, or from a flood water conveyance, where the post extraction condition, capacity or grade of the facility or conveyance does not exceed the as-built approved design specification contained in the approved documents for the facility or conveyance, shall be exempt from the provisions of the Act.

(3) The excavation, grading, or transportation of mineral materials, including overburden, exclusive of commercial surface mining activities as defined in Public Resources Code Section 2714(d), that is wholly integral and necessary to the conduct of agricultural activities either onsite or on non-contiguous parcels, shall meet the requirements of Public Resources Code Section 2714(a) for farming excavations or grading. This exemption does not apply to the exportation of mineral materials, including overburden, from the property that is in excess of 1,000 cubic yards for commercial purposes.

(b) Vested Rights. The permit and reclamation plan requirements for persons with vested rights are stated in Public Resources Code Section 2776.

Where a person with vested rights continues surface mining in the same area subsequent to January 1, 1976, he shall obtain an approval of a reclamation plan covering the mined lands disturbed by such subsequent surface mining. In those cases where an overlap exists (in the horizontal and/or vertical sense) between pre- and post-Act mining, the reclamation plan shall call for reclamation proportional to that disturbance caused by the mining after the effective date of the Act.

NOTE: Authority cited: Sections 2714(d) and 2755, Public Resources Code. Reference: Sections 2714, 2758(c) and 2776, Public Resources Code.

Article 6. Mineral Resource Management Policies

§ 3675. Definitions. The following definitions as used herein shall govern the interpretation of these regulations:

Compatible Land Use. Land uses inherently compatible with mining and/or that require a minimum public or private investment in structures, land improvements, and which may allow mining because of the relative economic value of the land and its improvements. Examples of such uses may include, but shall not be limited to, very low density residential, geographically extensive but low impact industrial, recreational, agricultural, silvicultural, grazing, and open space.

Incompatible Land Use. Land uses inherently incompatible with mining and/or that require public or private investment in structures, land improvements, and landscaping and that may prevent mining because of the greater economic value of the land and its improvements. Examples of such uses may include, but shall not be limited to, high density residential, low density residential with high unit value, public facilities, geographically limited but impact intensive industrial, and commercial.

NOTE: Authority cited: Section 2755, Public Resources Code. Reference: Sections 2761-2762, Public Resources Code.

§ 3676. Mineral Resource Management Policies.

Lead agency mineral resource management policies adopted pursuant to the provisions of PRC Section 2762 shall include but not be limited to, the following:

(a) A summary of the information provided by the classification and/or designation reports, or incorporation of PRC Sections 2710 et seq., and state policy by reference, together with maps of the identified mineral deposits or incorporation by reference of the classification and/or designation maps provided by the Board.

(b) Statements of policy in accordance with the provisions of PRC Section 2762(a).

(c) Implementation measures that shall include:

(1) Reference in the general plan of the location of identified mineral deposits, and a discussion of those areas targeted for conservation and possible future extraction by the lead agency.

(2) Use of overlay maps or inclusion of information on any appropriate planning maps to clearly delineate identified mineral deposits and those areas targeted by the lead agency for conservation and possible future extraction.

(3) At least one of the following:

(A) Use of special purpose overlay zones, mineral resource/open space zoning, or any other appropriate zoning that identifies the presence of identified mineral deposits and restricts the encroachment of incompatible land uses in those areas that are to be conserved.

(B) Record, on property titles in the affected mineral resource areas, a notice identifying the presence of identified mineral deposits.

(C) Impose conditions upon incompatible land uses in and surrounding areas containing identified mineral deposits for the purpose of mitigating the significant land use conflicts prior to approving a use that would otherwise be incompatible with mineral extraction.

NOTE: Authority cited: Section 2755, Public Resources Code. Reference: Sections 2757 and 2761-63, Public Resources Code.

Article 8. Fee Schedule

§ 3695. Definitions.

The following definitions shall govern the interpretation of these regulations:

"Produced Minerals" means minerals extracted at the site of the mining operation, and either:

(a) sold, given or otherwise moved off the site of the operation, as defined in the approved reclamation plan, or;

(b) used onsite for production of completed products (e.g. cement, bricks, asphaltic concrete, etc.).

Stockpiles of mineral products that remain on the site, as defined in the lead agency approved reclamation plan, are not produced minerals for purposes of these regulations.

"Primary Mineral Commodity Produced" means the produced mineral that provides the highest dollar values sales for the operation.

"Board" means State Mining and Geology Board.

As used in Section 3697 and 3699 "Mining Company" means any entity, corporation, partnership, parent or holding company. Any subsidiaries of the above are deemed to be part of the mining company.

As used in Section 3699, "Gross Income" means all income from whatever source derived as defined by, and determined in accordance with, Section 61 of the Internal Revenue Code, Title 26, U.S.C.S.

"Aggregate Products" means decomposed granite, sand and gravel, slag, or stone.

"Industrial Minerals" means borates, cinders, clay, diatomite, dolomite, gypsum, iron ore, lime, limestone, perlite, pumice, rare earth elements, saline compounds, salt, shale, silica, specialty sand, abrasives, asbestos, barite, bituminous rock, decorative rock, dimension stone, feldspar, fluorite, gemstones, graphite, kyanite, lignite, lithium, magnesite, mica, olivine, peat, phosphate, potash, pyrophyllite, quartz crystal, sea shells, sercite, talc, vermiculite, wollastonite, zeolites, and zircon.

"Gold, Silver, and Precious Metals" means gold (lode), gold (placer), platinum group metals, and silver.

"Base Metals and Other Metals" means antimony, arsenic, chromite, copper, lead, mangtanese, mercury, molybdenum, nickel, pyrite, tin, titanium, tungsten, uranium, vanadium, and zinc.

NOTE: Authority cited: Sections 2207(d)(1)-(2), Public Resources Code. Reference: Sections 2207 (d)(1)-(2) and 2207(f), Public Resources Code.

§ 3696. Operations Subject to Fees.

(a) Each surface mining operation, as defined in Public Resources Code Sections 2719, 2727.1, 2735, and California Code of Regulations, Title 14, Section 3501, unless exempted by Public Resources Code Section 2714, shall be assessed an annual reporting fee according to the schedule established

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pursuant to in Section 3698 each May 1 following the reporting calendar year.

(b) In addition to the annual reporting fee, each surface mining operation that is newly permitted shall be assessed an initial reporting fee according to the schedule in Section 3698 of this article.

NOTE: Authority cited: Section 2207, Public Resources Code. Reference: Section 2207, Public Resources Code.

§ 3697. Fees Due and Delinquent.

(a) The annual reporting fee and Mining Operation Annual Report (MRRC-2) are due and payable to the Department of Conservation not later than July 1 for the prior reporting year, by the owner or operator of record on the preceding December 31. The initial reporting fee for a new surface mining operation, together with an initial report, are due and payable to the Department of Conservation not later than thirty (30) days after permit approval. An owner or operator of a surface mining operation submitting an annual reporting fee or annual report after July 1, or more than thirty (30) days after permit approval, shall be assessed a penalty fee and interest as provided in Public Resources Code Section 2207 (c) and (d)(5).

(b) Except as otherwise provided in (c), for the purposes of this article, surface mining operations are deemed to be discrete operations per each reclamation plan required.

(c) Multiple site surface mining operations are deemed to be those active surface mining operations which meet all of the following criteria:

(1) One or more surface mining operations are operated on one or more sites by a single operator or mining company;

(2) The total annual combined mineral production for all sites is less than 100 troy ounces for precious metals, if precious metals are the primary mineral commodity produced, or less than 100,000 short tons if the primary mineral commodity product is not precious metals;

(3) All of the sites included are active;

(4) All of the operator or company's entire active surface mining operations located in the State of California are tied to, or located on, the listed sites; and

(d) In addition to the criteria provided in (c), multiple site mining operator's submittal of the annual report form (Mining Operation Annual Report, Form MRRC-2) shall be accompanied by a multiple site form (Multiple Site Single Fee Request, Form MRRC-4M) supplied by the Department of Conservation.

NOTE: Authority cited: Section 2207, Public Resources Code. Reference: Section 2207, Public Resources Code.

§ 3698. Fees Calculation.

(a) The annual reporting fee for a multiple site surface mining operation shall be two thousand dollars ($2000).

(b) The annual reporting fee for surface mining operations which are no longer in operation with no intent to resume, which had no mineral production in the reporting calendar year, and

(1) Which did not complete reclamation during the reporting calendar year shall be $50; or

(2) Which completed reclamation during the reporting calendar year shall be $50. Proof of completion of reclamation, approved by the lead agency, shall be submitted with this fee.

(c) Except as otherwise provided, the annual reporting fee for surface mining operations shall be calculated on the total primary mineral commodity produced in the reporting calendar year. A factor to determine the amount of fee adjustments shall be calculated according to the following formula:

$$[((ATRY) - (ATPY))/(ATPY)] = Factor$$

Where: Adjusted Total (AT) equals the Amount Requested by the Director, less a projected amount from fixed fees set in CCR §3698 (a)(b)(d)(e) and CCR §3699, and less a projected amount from mine operations subject to the maximum fee amount of $2,000;

Where: ATRY is the Adjusted Total for the current "Reporting Year"

Where: ATPY is the Adjusted Total for the "Prior Year"

The new Fee Amount for each category is determined by the following formula (calculated amounts cannot be less than $50 or more than $2,000, and may be rounded to the nearest $5 (five dollars):

Formula 1: Current Year Reporting Fee = Prior Year Reporting Fee times (1 + Factor) if Factor is positive;

Formula 2: Current Year Reporting Fee = Prior Year Reporting Fee times (1 - Factor) if Factor is negative.

(1) Operations where the primary mineral commodity produced is either aggregate products or industrial minerals shall be assessed a fee as follows:

Tons	Fee in Dollars
0 - 100	Formula 1 or 2 (not less than $50)
>100 - 1,000	Formula 1 or 2
>1,000 - 10,000	Formula 1 or 2
>10,000 - 50,000	Formula 1 or 2
>50,000 - 100,000	Formula 1 or 2
>100,000	2,000

(2) Operations where the primary mineral commodity produced is gold, silver, or precious metals shall be assessed a fee as follows:

Ounces	Fee in Dollars
0 - 1	Formula 1 or 2 (not less than $50)
> 1 - 10	Formula 1 or 2
>10 - 50	Formula 1 or 2
>50 - 150	Formula 1 or 2
>150 - 300	Formula 1 or 2
>300	2,000

(3) Operations where the primary mineral commodity produced is base metals or other metals shall be assessed a fee as follows:

Pounds	Fee in Dollars
0 - 10	Formula 1 or 2 (not less than $50)
>10 - 100	Formula 1 or 2
>100 - 1,000	Formula 1 or 2
>1,000 - 10,000	Formula 1 or 2
>10,000 - 20,000	Formula 1 or 2
>20,000	2,000

(d) The initial reporting fee for surface mining operations shall be five hundred dollars ($500).

(e) The annual reporting fee for newly permitted surface mining operations which have not yet begun operations shall be fifty dollars ($50).

NOTE: Authority cited: Section 2207, Public Resources Code. Reference: Section 2207, Public Resources Code.

§ 3699. Low Gross Exemptions.

(a) For the calendar reporting year, a single operator or mining company may file with the Office of Mine Reclamation of the Department of Conservation, a written request for an exemption from the method of fee assessment set forth in Section 3698. Neither the State, nor any county, city, district or other political subdivision shall be eligible for an exemption under this Section. A request for an exemption must be filed on a form (Low Gross Exemption Fee Request, Form MRRC-4L) supplied by the Department of Conservation and received by the Department of Conservation by July 1 following the calendar reporting year. The Department of Conservation shall grant the exemption if information submitted and confirmed by the annual report form and approved reclamation plan or plans, clearly demonstrates that the operation meets the following criteria:

(1) material is extracted from one surface mining operation, and lead agency approval of a reclamation plan and financial assurance has been obtained; and

(2) all of the single operator or mining company's surface mining operation located in the State of California is tied to, or located on, one site; and

(3) the amount of the operator's gross income from the surface mining operation for the reporting calendar year was less than $100,000, and proof of gross income is supplied in the form of a signed federal tax return or returns accompanied by a completed and signed Federal Internal Revenue Service Form 4506, or a report prepared and signed by a certified public accountant; and

(4) the owner or operator has submitted an annual reporting fee of two hundred dollars ($200).

(b) For any request received on or before July 1 following the reporting calendar year the Department may afford the applicant one 30-day period in which to correct minor deficiencies in the application.

(c) If the Department of Conservation determines that an exemption is not warranted, the operator may appeal that determination to the Board. The appeal must be submitted in writing within fifteen (15) days of the denial of exemption notification by the Department of Conservation. The Chairman of the Board or his designee (Board Member), shall determine whether the Board has jurisdiction for the purposes of an appeal. In order for the Board to have jurisdiction the appeal must:

(1) Demonstrate the exemption request was complete and filed in a timely fashion;

(2) Specifically relate to the exemption criteria outlined in this Section; and

(3) Specify the appellant's arguments for granting the exemption.

(d) If the appeal is within the Board's jurisdiction, the Board, based on all the evidence in the record, may affirm the Department's decision or grant the exemption. If the operator does not appeal, the appeal is not within the Board's jurisdiction, or the Board affirms the Department's decision, the operator or owner shall submit an annual reporting fee calculated upon the total mineral commodity produced pursuant to Section 3698. Such fee shall be submitted within thirty (30) days of notification by the Department of Conservation or the Board. An operator or owner submitting an annual reporting fee

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later than thirty (30) days after notification shall be assessed a penalty and interest as provided in Public Resources Code Section 2207(d)(5).
NOTE: Authority cited: Section 2207, Public Resources Code. Reference: Section 2207, Public Resources Code.

Article 9. Reclamation Standards

§ 3700. Applicability. Reclamation of mined lands shall be implemented in conformance with the standards in this Article.

(a) The standards shall apply to each surface mining operation to the extent that:

(1) they are consistent with required mitigation identified in conformance with the California Environmental Quality Act, provided that such mitigation is at least as stringent as the standards; and

(2) they are consistent with the planned or actual subsequent use or uses of the mining site.

(b) Where an applicant demonstrates to the satisfaction of the lead agency that an exception to the standards specified in this article is necessary based upon the approved end use, the lead agency may approve a different standard for inclusion in the approved reclamation plan. Where the lead agency allows such an exception, the approved reclamation plan shall specify verifiable, site-specific standards for reclamation. The lead agency may set standards which are more stringent than the standards set forth in this Article; however, in no case may the lead agency approve a reclamation plan which sets any standard which is less stringent than the comparable standard specified in this Article.

(c) When substantial amendments are proposed to reclamation plans which were approved prior to January 15, 1993, the standards set forth in this Article shall be applied by the lead agency in approving or denying approval of the amended reclamation plan.

(d) The standards in this Article shall not apply to mining operations:

(1) which completed reclamation prior to January 15, 1993, in conformance with an approved reclamation plan; or

(2) for which a reclamation plan has been approved prior to January 15, 1993.

NOTE: Authority cited: Sections 2755, 2756 and 2773, Public Resources Code. Reference: Section 2773, Public Resources Code.

§ 3701. Definitions. The following definitions shall govern the interpretation of these regulations:

"Arid" means landscapes with an average annual precipitation of five inches or less.

"Contamination" means an impairment of the quality of the waters of the state to a degree which creates a hazard to the public health through poisoning or through the spread of disease.

"Highwall" means the unexcavated face of exposed overburden and ore in a surface mine.

"Indigenous Plants" means plants occurring naturally in an area, not introduced.

"Native Species" means plant species indigenous to California, using pre-European as the historic time reference.

"Noxious Weeds" means any species of plant that is or is likely to become destructive or difficult to control or eradicate, and is termed to be so by the Director of the Department of Food and Agriculture in section 4500, Title 3 of the California Code of Regulations, pursuant to the Food and Agriculture Code section 5004 et seq.

"Vegetative Cover" means the vertical projection of the crown or shoot area of a species to the ground surface expressed as a percentage of the reference area (percentage can be greater than 100 percent).

"Vegetative Density" means the number of individuals or stems of each species rooted within the given reference area.

"Vegetative Species-richness" means the number of different plant species within the given reference area.

"Wetlands" for the purposes of these regulations, the definition of wetlands shall be the same as defined in the California Fish and Game Code, section 2785, subdivision (g).
NOTE: Authority cited: Sections 2755, 2756 and 2773, Public Resources Code. Reference: Section 2773, Public Resources Code.

§ 3702. Financial Assurances. Lead agencies shall require financial assurances for reclamation in accordance with Public Resources Code section 2773.1 to ensure that reclamation is performed in accordance with the approved reclamation plan and with this article.
NOTE: Authority cited: Sections 2755, 2773 and 2773.1, Public Resources Code. Reference: Sections 2773 and 2773.1, Public Resources Code.

§ 3703. Performance Standards for Wildlife Habitat.

Wildlife and wildlife habitat shall be protected in accordance with the following standards:

(a) Rare, threatened or endangered species as listed by the California Department of Fish and Game, (California Code of Regulations, Title 14,

sections 670.2 - 670.5) or the U. S. Fish and Wildlife Service, (50 CFR 17.11 and 17.12) or species of special concern as listed by the California Department of Fish and Game in the Special Animals List, Natural Diversity Data Base, and their respective habitat, shall be conserved as prescribed by the federal Endangered Species Act of 1973, 16 U.S.C. section 1531 et. seq., and the California Endangered Species Act, Fish and Game Code section 2050 et seq. If avoidance cannot be achieved through the available alternatives, mitigation shall be proposed in accordance with the provisions of the California Endangered Species Act, Fish and Game Code section 2050 et seq., and the federal Endangered Species Act of 1973, 16 U.S.C. section 1531 et seq.

(b) Wildlife habitat shall be established on disturbed land in a condition at least as good as that which existed before the lands were disturbed by surface mining operations, unless the proposed end use precludes its use as wildlife habitat or the approved reclamation plan establishes a different habitat type than that which existed prior to mining.

(c) Wetland habitat shall be avoided. Any wetland habitat impacted as a consequence of surface mining operations shall be mitigated at a minimum of one to one ratio for wetland habitat acreage and wetland habitat value.

NOTE: Authority cited: Sections 2755, 2756 and 2773, Public Resources Code. Reference: Section 2773, Public Resources Code.

§ 3704. Performance Standards for Backfilling, Regrading, Slope Stability, and Recontouring. Backfilling, regrading, slope stabilization, and recontouring shall conform with the following standards:

(a) Where backfilling is proposed for urban uses (e.g., roads, building sites, or other improvements sensitive to settlement), the fill material shall be compacted in accordance with section 7010, Chapter 70 of the Uniform Building Code, published by the International Conference of Building Officials (1991), the local grading ordinance, or other methods approved by the lead agency as appropriate for the approved end use.

(b) Where backfilling is required for resource conservation purposes (e.g., agriculture, fish and wildlife habitat, and wildland conservation), fill material shall be backfilled to the standards required for the resource conservation use involved.

(c) Piles or dumps of mining waste shall be stockpiled in such a manner as to facilitate phased reclamation. They shall be segregated from topsoil and topsoil substitutes or growth media salvaged for use in reclamation.

(d) Final reclaimed fill slopes, including permanent piles or dumps of mine waste rock and overburden, shall not exceed 2:1 (horizontal:vertical), except when site-specific geologic and engineering analysis demonstrate that the proposed final slope will have a minimum slope stability factor of safety that is suitable for the proposed end use, and when the proposed final slope can be successfully revegetated.

(e) At closure, all fill slopes, including permanent piles or dumps of mine waste and overburden, shall conform with the surrounding topography and/or approved end use.

(f) Cut slopes, including final highwalls and quarry faces, shall have a minimum slope stability factor of safety that is suitable for the proposed end use and conform with the surrounding topography and/or approved end use.

(g) Permanent placement of piles or dumps of mining waste and overburden shall not occur within wetlands unless mitigation acceptable to the lead agency has been proposed to offset wetland impacts and/or losses.

NOTE: Authority cited: Sections 2755, 2756 and 2773, Public Resources Code. Reference: Section 2773, Public Resources Code.

§ 3705. Performance Standards for Revegetation.

Revegetation shall be part of the approved plan, unless it is not consistent with the approved end use.

(a) A vegetative cover suitable for the proposed end use and capable of self-regeneration without continued dependence on irrigation, soil amendments or fertilizer shall be established on disturbed land unless an artificially maintained landscape is consistent with the approved reclamation plan. Vegetative cover or density, and species-richness shall be, where appropriate, sufficient to stabilize the surface against effects of long-term erosion and shall be similar to naturally occurring habitats in the surrounding area. The vegetative density, cover and species richness of naturally occurring habitats shall be documented in baseline studies carried out prior to the initiation of mining activities. However, for areas that will not be reclaimed to prior conditions, the use of data from reference areas in lieu of baseline site data is permissible.

(b) Test plots conducted simultaneously with mining shall be required to determine the most appropriate planting procedures to be followed to

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ensure successful implementation of the proposed revegetation plan. The lead agency may waive the requirement to conduct test plots when the success of the proposed revegetation plan can be documented from experience with similar species and conditions or by relying on competent professional advice based on experience with the species to be planted.

(c) Where surface mining activities result in compaction of the soil, ripping, disking, or other means shall be used in areas to be revegetated to eliminate compaction and to establish a suitable root zone in preparation for planting.

(d) Prior to closure, all access roads, haul roads, and other traffic routes to be reclaimed shall be stripped of any remaining roadbase materials, prepared in accordance with subsection 3705(g), covered with suitable growth media or topsoil, and revegetated. When it is not necessary to remove roadbase materials for revegetative purposes, lead agencies may set a different standard as specified in section 3700(b) of this Article.

(e) Soil analysis shall be required to determine the presence or absence of elements essential for plant growth and to determine those soluble elements that may be toxic to plants, if the soil has been chemically altered or if the growth media consists of other than the native topsoil. If soil analysis suggests that fertility levels or soil constituents are inadequate to successfully implement the revegetative program, fertilizer or other soil amendments may be incorporated into the soil. When native plant materials are used, preference shall be given to slow-release fertilizers, including mineral and organic materials that mimic natural sources, and shall be added in amounts similar to those found in reference soils under natural vegetation of the type being reclaimed.

(f) Temporary access for exploration or other short-term uses on arid lands shall not disrupt the soil surface except where necessary to gain safe access. Barriers shall be installed when necessary to gain safe access. Barriers shall be installed when necessary to prevent unauthorized vehicular traffic from interfering with the reclamation of temporary access routes.

(g) Native plant species shall be used for revegetation, except when introduced species are necessary to meet the end uses specified in the approved reclamation plan. Areas to be developed for industrial, commercial, or residential use shall be revegetated for the interim period, as necessary, to control erosion. In this circumstance, non-native plant species may be used if they are not noxious weeds and if they are species known not to displace native species in the area.

(h) Planting shall be conducted during the most favorable period of the year for plant establishment.

(i) Soil stabilizing practices shall be used where necessary to control erosion and for successful plant establishment. Irrigation may be used when necessary to establish vegetation.

(j) If irrigation is used, the operator must demonstrate that the vegetation has been self-sustaining without irrigation for a minimum of two years prior to release of the financial assurances by the lead agency, unless an artificially maintained landscape is consistent with the approved end use.

(k) Noxious weeds shall be managed: (1) when they threaten the success of the proposed revegetation; (2) to prevent spreading to nearby areas; and (3) to eliminate fire hazard.

(l) Protection measures, such as fencing of revegetated areas and/or the placement of cages over individual plants, shall be used in areas where grazing, trampling, herbivory, or other causes threaten the success of the proposed revegetation. Fencing shall be maintained until revegetation efforts are successfully completed and the lead agency authorizes removal.

(m) Success of revegetation shall be judged based upon the effectiveness of the vegetation for the approved end use, and by comparing the quantified measures of vegetative cover, density, and species-richness of the reclaimed mined-lands to similar parameters of naturally occurring vegetation in the area. Either baseline data or data from nearby reference areas may be used as the standard for comparison. Quantitative standards for success and the location(s) of the reference area(s) shall be set forth in the approved reclamation plan. Comparisons shall be made until performance standards are met provided that, during the last two years, there has been no human intervention, including, for example, irrigation, fertilization, or weeding. Standards for success shall be based on expected local recovery rates. Valid sampling techniques for measuring success shall be specified in the approved reclamation plan. Sample sizes must be sufficient to produce at least an 80 percent confidence level. There are standard statistical methods in commonly available literature for determining an 80 percent confidence level on a site-by-site basis. Examples of such literature include, but are not limited to, D. Mueller-Dombois and H. Ellenberg, 1974, "Aims and Methods of Vegetation Ecology", John Wiley and Sons, Inc., or C. D. Bonham, 1988, "Measurements for Terrestrial Vegetation", John Wiley and Sons,

Inc., and are available at many university libraries. The texts are also available at some local libraries through the Inter-Library Loan Program.
NOTE: Authority cited: Sections 2755, 2756 and 2773, Public Resources Code. Reference: Section 2773, Public Resources Code.

§ 3706. Performance Standards for Drainage, Diversion Structures, Waterways, and Erosion Control.

(a) Surface mining and reclamation activities shall be conducted to protect on-site and downstream beneficial uses of water in accordance with the Porter-Cologne Water Quality Control Act, Water Code section 13000, et seq., and the Federal Clean Water Act, 33 U.S.C. section 1251, et seq.

(b) The quality of water, recharge potential, and storage capacity of ground water aquifers which are the source of water for domestic, agricultural, or other uses dependent on the water, shall not be diminished, except as allowed in the approved reclamation plan.

(c) Erosion and sedimentation shall be controlled during all phases of construction, operation, reclamation, and closure of a surface mining operation to minimize siltation of lakes and watercourses, as required by the Regional Water Quality Control Board or the State Water Resources Control Board.

(d) Surface runoff and drainage from surface mining activities shall be controlled by berms, silt fences, sediment ponds, revegetation, hay bales, or other erosion control measures, to ensure that surrounding land and water resources are protected from erosion, gullying, sedimentation and contamination. Erosion control methods shall be designed to handle runoff from not less than the 20 year/1 hour intensity storm event.

(e) Where natural drainages are covered, restricted, rerouted, or otherwise impacted by surface mining activities, mitigating alternatives shall be proposed and specifically approved in the reclamation plan to assure that runoff shall not cause increased erosion or sedimentation.

(f) When stream diversions are required, they shall be constructed in accordance with:

(1) the stream and lake alteration agreement between the operator and the Department of Fish and Game; and

(2) the requirements of the Federal Clean Water Act, Sections 301 (33 U.S.C. 1311) and Section 404 (33 U.S.C. 1344) and/or Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403).

(g) When no longer needed to achieve the purpose for which they were authorized, all temporary stream channel diversions shall be removed and the affected land reclaimed.
NOTE: Authority cited: Sections 2755, 2756 and 2773, Public Resources Code. Reference: Section 2773, Public Resources Code.

§ 3707. Performance Standards for Prime Agricultural Land Reclamation. In addition to the standards for topsoil salvage, maintenance, and redistribution, the following standards shall apply to mining operations on prime agricultural lands where the approved end use is agriculture:

(a) Mining operations which will operate on prime agricultural lands, as defined by the U.S. Soil Conservation Service, shall return all disturbed areas to a fertility level as specified in the approved reclamation plan.

(b) When distinct soil horizons are present, topsoil shall be salvaged and segregated by defined A, B, and C soil horizons. Upon reconstruction of the soil, the sequence of horizons shall have the A atop the B, the B atop the C, and the C atop graded overburden.

(c) Reclamation shall be deemed complete when productive capability of the affected land is equivalent to or exceeds, for two consecutive crop years, that of the premining condition or similar crop production in the area. Productivity rates, based on reference areas described in the approved reclamation plan, shall be specified in the approved reclamation plan.

(d) Use of fertilizers or other soil amendments shall not cause contamination of surface or ground water.
NOTE: Authority cited: Sections 2755, 2756 and 2773, Public Resources Code. Reference: Section 2773, Public Resources Code.

§ 3708. Performance Standards for Other Agricultural Land. The following standards shall apply to agricultural lands, other than prime agricultural lands, when the approved end use is agriculture.

In addition to the standards for topsoil salvage, maintenance, and redistribution, non-prime agricultural lands shall be reclaimed so as to be capable of sustaining economically viable production of crops commonly grown in the surrounding areas.
NOTE: Authority cited: Sections 2755, 2756 and 2773, Public Resources Code. Reference: Section 2773, Public Resources Code.

§ 3709. Performance Standards for Building, Structure, and Equipment Removal.

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(a) All equipment, supplies and other materials shall be stored in designated areas (as shown in the approved reclamation plan). All waste shall be disposed of in accordance with state and local health and safety ordinances.

(b) All buildings, structures, and equipment shall be dismantled and removed prior to final mine closure except those buildings, structures, and equipment approved in the reclamation plan as necessary for the end use.

NOTE: Authority cited: Sections 2755, 2756 and 2773, Public Resources Code. Reference: Section 2773, Public Resources Code.

§ 3710. Performance Standards for Stream Protection, Including Surface and Groundwater.

(a) Surface and groundwater shall be protected from siltation and pollutants which may diminish water quality as required by the Federal Clean Water Act, sections 301 et seq. (33 U.S.C. section 1311), 404 et seq. (33 U.S.C. section 1344), the Porter-Cologne Act, section 13000 et seq., County anti-siltation ordinances, the Regional Water Quality Control Board or the State Water Resources Control Board.

(b) In-stream surface mining operations shall be conducted in compliance with Section 1600 et seq. of the California Fish and Game Code, section 404 of the Clean Water Act, and Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403).

(c) Extraction of sand and gravel from river channels shall be regulated to control channel degradation in order to prevent undermining of bridge supports, exposure of pipelines or other structures buried within the channel, loss of spawning habitat, lowering of ground water levels, destruction of riparian vegetation, and increased stream bank erosion (exceptions may be specified in the approved reclamation plan). Changes in channel elevations and bank erosion shall be evaluated annually using records of annual extraction quantities and benchmarked annual cross sections and/or sequential aerial photographs to determine appropriate extraction locations and rates.

(d) In accordance with requirements of the California Fish and Game Code section 1600 et seq., in-stream mining activities shall not cause fish to become entrapped in pools or in off-channel pits, nor shall they restrict spawning or migratory activities.

NOTE: Authority cited: Sections 2755, 2756 and 2773, Public Resources Code. Reference: Section 2773, Public Resources Code.

§ 3711. Performance Standards for Topsoil Salvage, Maintenance, and Redistribution. When the approved reclamation plan calls for revegetation or cultivation of disturbed lands, the following performance standards shall apply to topsoil salvage, maintenance, and redistribution activities:

(a) All salvageable topsoil suitable for revegetation shall be removed as a separate layer from areas to be disturbed by mining operations. Topsoil and vegetation removal shall not precede surface mining activities by more than one year, unless a longer time period is approved by the lead agency.

(b) Topsoil resources shall be mapped prior to stripping and the location of topsoil stockpiles shall be shown on a map in the reclamation plan. If the amount of topsoil needed to cover all surfaces to be revegetated is not available on site, other suitable material capable of sustaining vegetation (such as subsoil) shall be removed as a separate layer for use as a suitable growth media. Topsoil and suitable growth media shall be maintained in separate stockpiles. Test plots may be required to determine the suitability of growth media for revegetation purposes.

(c) Soil salvage operations and phases of reclamation shall be carried out in accordance with a schedule that: (1) is set forth in the approved reclamation plan; (2) minimizes the area disturbed; and (3) is designed to achieve maximum revegetation success allowable under the mining plan.

(d) Topsoil and suitable growth media shall be used to phase reclamation as soon as can be accommodated by the mining schedule presented in the approved reclamation plan following the mining of an area. Topsoil and suitable growth media that cannot be utilized immediately for reclamation shall be stockpiled in an area where it will not be disturbed until needed for reclamation. Topsoil and suitable growth media stockpiles shall be clearly identified to distinguish them from mine waste dumps. Topsoil and suitable growth media stockpiles shall be planted with a vegetative cover or shall be protected by other equally effective measures to prevent water and wind erosion and to discourage weeds. Relocation of topsoil or suitable growth media stockpiles for purposes other than reclamation shall require prior written approval from the lead agency.

(e) Topsoil and suitable growth media shall be redistributed in a manner that results in a stable, uniform thickness consistent with the approved end use, site configuration, and drainage patterns.

NOTE: Authority cited: Sections 2755, 2756 and

2773, Public Resources Code. Reference: Section 2773, Public Resources Code.

§ 3712. Performance Standards for Tailing and Mine Waste Management.

State Water Resources Control Board mine waste disposal regulations in Article 7 of Chapter 15 of Title 23, California Code of Regulations, shall govern mine waste and tailings, and mine waste disposal units shall be reclaimed in conformance with this article.

NOTE: Authority cited: Sections 2755, 2756 and 2773, Public Resources Code. Reference: Section 2773, Public Resources Code.

§ 3713. Performance Standards for Closure of Surface Openings.

(a) Except those used solely for blasting or those that will be mined through within one year, all drill holes, water wells, and monitoring wells shall be completed or abandoned in accordance with each of the following:

(1) Water Code sections 13700, et seq. and 13800, et seq.;

(2) the applicable local ordinance adopted pursuant to Water Code section 13803;

(3) the applicable Department of Water Resources report issued pursuant to Water Code section 13800; and

(4) Subdivisions (1) and (2) of section 2511(g) of Chapter 15 of Title 23 regarding discharge of waste to land.

(b) Prior to closure, all portals, shafts, tunnels, or other surface openings to underground workings shall be gated or otherwise protected from public entry in order to eliminate any threat to public safety and to preserve access for wildlife habitat.

NOTE: Authority cited: Sections 2755, 2756 and 2773, Public Resources Code. Reference: Section 2773, Public Resources Code.

Article 11. Financial Assurance Mechanisms

§ 3800. Purpose. It is the purpose of this article to specify additional financial assurance mechanisms to assure reclamation pursuant to Public Resources Code Section 2710 et seq. (Surface Mining and Reclamation Act, as amended).

NOTE: Authority cited: Section 2773.1, Public Resources Code. Reference: Section 2773.1(e), Public Resources Code.

§ 3801. Authority. Review, approval, adjustment, enforcement, notification, forfeiture and all other responsibilities of the lead agency, operator and Department of Conservation with respect to financial assurances shall be conducted as prescribed in Public Resources Code Section 2710 et seq. unless expressly outlined in this article.

NOTE: Authority cited: Section 2773.1, Public Resources Code. Reference: Section 2773.1(e), Public Resources Code.

§ 3802. Definitions. The following definitions shall govern the interpretation of this article:

(a) "Budget Set Aside" means a financial assurance mechanism, meeting the requirements of Section 3806.2 of this article, by which a government entity proposes to make specific identified monies within the entity's budget available to perform reclamation pursuant to the approved reclamation plan.

(b) "Financial Assurance Amount" means that amount of money necessary to conduct and complete reclamation on the mined lands in accordance with the approved reclamation plan, plus a reasonable estimate of the administrative costs and expenses which would be incurred by the lead agency or the Department of Conservation, the total of which shall be calculated in accordance with section 3804, and shall constitute an obligation to pay by the operator.

(c) "Financial Assurance" means an instrument, fund or other form of Financial Assurance as provided in Section 2773.1(a) and (e) of the Public Resources Code and this Article.

(d) "Pledge of Revenue" means a financial assurance mechanism meeting the requirements of Section 3806.1, of this Article, by which a governmental entity proposes to make specific, identified future revenue available to perform reclamation pursuant to the approved reclamation plan.

NOTE: Authority cited: Section 2755, Public Resources Code. Reference: Sections 2726-2734, Public Resources Code.

§ 3803. Financial Assurance Mechanisms. As outlined by this article, financial assurances may take the form of any one or a combination of the following, which the lead agency, upon review by the Department of Conservation, reasonably determines are adequate to perform reclamation in accordance with the approved reclamation plan.

(a) For non-governmental entity operators:

(1) Surety bonds;

(2) Irrevocable letters of credit; and

(3) Trust funds;

(b) For governmental entity operators:

(1) Surety bonds;

(2) Irrevocable letters of credit;

(3) Trust funds;

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(4) Pledges of Revenue; or

(5) Budget Set Aside.

NOTE: Authority cited: Section 2773.1, Public Resources Code. Reference: Section 2773.1(e), Public Resources Code.

§ 3804. Calculation of Financial Assurance Amount.

(a) The Financial Assurance Amount shall be calculated as prescribed in Public Resources Code Section 2773.1 and based on:

(1) an analysis of the physical activities and materials necessary to implement the approved reclamation plan;

(2) the lead agency's unit costs, or costs for third party contracting, for each of these activities, if applicable;

(3) the number of units of each of these activities, if applicable;

(4) a contingency amount not to exceed 10% of the reclamation costs.

(b) The calculated amount should not include the cost of completing mining of the site.

(c) In order for the lead agency or the Department of Conservation to determine what annual adjustments, if any, are appropriate to the Financial Assurance Amount, the operator shall annually submit to the lead agency a revision of the written calculation required under Section 3804(a).

NOTE: Authority cited: Section 2773.1, Public Resources Code. Reference: Section 2773.1(e), Public Resources Code.

§ 3805. Review by the Department of Conservation.

Pursuant to Section 2774(c), Public Resources Code, the lead agency shall submit a copy of the proposed Financial Assurance and the Calculation of Financial Assurance Amount submitted by the operator pursuant to Section 3804 to the Director of the Department of Conservation for review. With this submittal the lead agency shall include the information and documentation relied upon in calculating the amount of the proposed Financial Assurance and indicate to the Director that the Financial Assurance Amount is adequate for the lead agency or the Department of Conservation to conduct and complete reclamation on the mined lands in accordance with the approved reclamation plan. The Director shall have 45 days, upon receipt, to prepare written comments regarding the proposed Financial Assurance, if he/she so chooses.

NOTE: Authority cited: Section 2774, Public Resources Code. Reference: Section 2774(c), (d), Public Resources Code.

§ 3806. Surface mining operations owned and operated by state or local governmental entities.

In addition to the mechanisms provided in Public Resources Section 2773.1 and this article, a financial assurance mechanism for reclamation for a surface mining operation owned and operated by the state, county, city, district, or other political subdivision may be in the form of a:

(a) Pledge of Revenue; or

(b) Budget Set Aside.

These financial assurance mechanisms may only be used by the state, county, city, district, or other political subdivision.

NOTE: Authority cited: Section 2773.1, Public Resources Code. Reference: Section 2773.1(e), Public Resources Code.

§ 3806.1. Pledge of Revenue.

(a) A pledge of revenue shall consist of a resolution or other appropriate document from the governing body of the state, county, city, district, or other political subdivision responsible for reclamation of the mined lands pursuant to the approved reclamation plans. The resolution or document shall remain effective continuously throughout the period in which the pledge of revenue is used to satisfy the requirements of Section 2773.1, Public Resources Code.

(b) The pledge of revenue shall contain the following items:

(1) The resolution or document establishing the pledge of revenue;

(2) The types and sources of pledged revenue;

(3) The period of time that each source of revenue is pledged to be available;

(4) The calculation amount of the financial assurance prepared pursuant to Section 3804; and

(5) The authorization for the lead agency or the Department of Conservation to use the proceeds of the pledge to conduct and complete reclamation if the lead agency or the Department of Conservation determines that the operator is incapable of performing the reclamation covered by the pledge pursuant to Section 2773.1(b).

(c) The state, county, city, district, or other political subdivision may pledge any following types of revenue that it controls and that will be available in a timely manner to conduct and complete reclamation:

(1) Fees, rents, or other charges;

(2) Tax revenues within statutory limitations; and/or

(3) Other guaranteed revenues that are acceptable to the lead agency and the Board.

(d) If the governmental entity ceases at any time to retain control of its ability to allocate any pledged revenue to conduct and complete reclamation, the entity shall notify the lead agency and the Department of Conservation and shall obtain alternative coverage within 60 days after control lapses.

NOTE: Authority cited: Section 2773.1, Public Resources Code. Reference: Section 2773.1(e), Public Resources Code.

§ 3806.2. Budget Set Aside.

(a) A Budget Set Aside shall consist of a specific fund or line item set aside by the state, county, city, district or other political subdivision responsible for reclamation of the mined lands. The Budget Set Aside shall remain effective continuously throughout the period in which the Budget Set Aside is used to satisfy the requirements of Section 2773.1, Public Resources Code.

(b) The set aside shall contain the following items:

(1) A resolution or other appropriate document establishing the set aside or line item including proof of approval by the governing body or appropriate official of the state, county, city, district or other political subdivision;

(2) The types and sources of specific funds;

(3) The period of time that each funding source is to be available;

(4) The calculation amount of the financial assurance prepared pursuant to Section 3804; and

(5) The authorization for the lead agency or the Department of Conservation to use the funds to conduct and complete reclamation if the lead agency or the Department of Conservation determines that the operator is incapable of performing the reclamation covered by the set aside pursuant to Section 2773.1(b).

NOTE: Authority cited: Section 2773.1, Public Resources Code. Reference: Section 2773.1(e), Public Resources Code.

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April 7, 1999

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Co.	Co. State Lands Commission
Dept.	Phone #
Fax # 619 298 0146	Fax # 916 574 1885

Dear Mr. Cabanilla:

The purpose of this letter is to clarify our original response (dated February 1, 1999) to the Notice of Preparation of a Draft Environmental Impact Report (DEIR) for the Mesquite Mine Expansion project, SCH #98121054. This letter, therefore, supersedes and should be substituted within the environmental documentation for our February 1, 1999, Notice of Preparation response.

1 The DEIR should discuss the full range of environmental issues required under the California Environmental Quality Act (CEQA). Particular attention should be given to potential impacts to biological resources, including, but not limited to, rare, endangered, and threatened plant and animal species such as the Desert Tortoise, Munz's Cholla and Nelson's Bighorn Sheep. 2

Additionally, staff of the CSLC believes the following items should be addressed and/or contained in the environmental document.

3 Maps and cross sections prepared for the environmental document should clearly distinguish the State's ownership.

4 The DEIR should include information on current site conditions, including biological, cultural and scenic resources. Specific data should be provided on the Desert tortoise, Munz's Cholla, and Nelson's Bighorn Sheep at the site and on adjacent lands.

5 The environmental document should include a list of all other responsible and/or trustee agencies for the proposed project.

6 The document should contain: 1) an assessment as to the effectiveness and potential impacts of the Proposed Mine Closure and Reclamation Plan; and 2)

6. recommendations, as necessary, to improve its effectiveness in the restoration of mined areas to as near their original state as is feasible.

7. In the event that detoxification using fresh water does not work, the applicant is proposing to utilize microbial processes to detoxify the site. Potential environmental impacts to biological and water resources from this method should be addressed. Mitigation measures to reduce impacts from this process should also be identified. Please also provide, if available, evidence that this method has been approved by the Regional Water Quality Control Boards for other heap leach mines in California.

8. The project proposes to abandon, in place, the solution pond liners. The DEIR should describe what these liners are made of, how the applicant will verify that the liners are not contaminated with toxic materials, how long they are expected to remain in the environment and the potential impacts from leaving the liners in place versus removing them. Has abandonment of comparable pond liners in place been approved for other mine closures in California?

9. The DEIR should also provide complete references and/or reports regarding revegetation studies conducted at the Mesquite Mine. Complete references and/or reports should also be provided for revegetation testing programs at the two nearby mines.

10. The document should provide complete details on plantings. How long and under what conditions will the seeds, collected for revegetation, be stored prior to planting? Will seed viability studies be conducted on collected material prior to planting?

11. The DEIR should also describe the favorable environmental conditions under which germination is successful. Such a discussion should include, amongst other things, how often these conditions are met and how the revegetation plan will proceed in the event environmental conditions are such that germination is unsuccessful.

12. It appears that little if any "soil" suitable for plant growth will be available at the revegetation sites. How will the applicant aid in the development of soil in the biological sense, to accomplish project objectives? What are the mycorrhizal associations required by the species proposed for use in revegetated areas?

13. The draft document should include a discussion of the objectives of pit wall stabilization and the criteria that will be utilized to determine which pit walls will require stabilization.

14. Based on information provided to us by the applicant, reclamation success will be based on vegetation diversity, density and cover. The document should explain if perennial species and annual species will be monitored and why. Will the applicant use pre-mined conditions on those sites proposed for expansion to base reclamation success? Site selection for "control" (non-mined) sites should be selected to match as closely as possible the slope, aspect, and elevation found on the proposed revegetation sites.

15. The document should provide an explanation of the methodology and the number of years over which monitoring will take place on both "control sites" and "impact sites" and should explain the adequacy of the different approaches for each type of site.

We appreciate your consideration of these comments. If you have any questions, please contact Maurya Falkner at (562) 499-6312 or Greg Pelka at (562) 590-5227.

Sincerely,

Mary Griggs

MARY GRIGGS
Assistant Chief
Division of Environmental
Planning and Management

cc: Dwight E. Sanders
Marina Voskanian
Greg Pelka
Maurya Falkner
BRG Consulting, Inc.

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NOP

STATE OF CALIFORNIA — PETE WILSON, *Governor*

CALIFORNIA STATE LANDS COMMISSION
100 Howe Avenue, Suite 100 South
Sacramento, CA 95825-8202

ROBERT C. HIGHT, *Executive Officer*
(916) 574-1800 FAX (916) 574-1810
California Relay Service From TDD Phone 1-800-735-2922
from Voice Phone 1-800-735-2929

Contact Phone:
Contact FAX:

February 1, 1999

File Ref: W 9777.216

Mr. Richard Cabanilla
County of Imperial
Planning and Building Department
939 Main Street, Ste B-1
El Centro, CA 92243

Dear Mr. Cabanilla:

Staff of the California State Lands Commission (CSLC) has reviewed the Notice of Preparation (NOP) of an Environmental Impact Report (EIR) for the Mesquite Mine Expansion project, SCH #98121054. The CSLC is a Responsible Agency under the California Environmental Quality Act (CEQA) and offers the following comments.

1 The EIR should discuss the full range of environmental issues required under the CEQA. Particular attention should be given to potential impacts to biological resources, including, but not limited to rare, endangered, and threatened plant and animal species such as the Desert Tortoise, Munz's Cholla and Nelson's Bighorn Sheep.

We appreciate the opportunity to comment and look forward to reviewing the draft document. For your convenience, we have attached a copy of our incomplete application letter that was sent to Santa Fe Pacific Gold Corporation.

Please contact Maurya Falkner at (562) 499-6312 or Greg Pelka at (562) 499-5227 if you have any questions.

Sincerely,

Mary Griggs

MARY GRIGGS
Assistant Chief
Division of Environmental
Planning and Management

Attachment

cc: Marina Voskanian
Maurya Falkner
Greg Pelka

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STATE OF CALIFORNIA

GRAY DAVIS, Governor

CALIFORNIA STATE LANDS COMMISSION
200 Oceangate, 12th Floor
Beach, CA 90802-4331

ROBERT C. HIGHT, *Executive Officer*
ifornia Relay Service From TDD Phone 1-800-735-2922
from Voice Phone 1-800-735-2929

Contact Phone: (562-580-5201)
Contact FAX: (562-590-5295)

January 28, 1999

File Ref: PRC 8039.2

Mr. David R. Faley, Director, Land
Santa Fe Pacific Gold Corporation
1700 Lincoln Street, 26th Floor
Denver, Colorado 80203

Dear Mr. Faley:

This acknowledges receipt of Santa Fe Pacific Gold's Mineral Extraction Lease Application and fees of $5,025 to cover the $25 filing fee and $5,000 estimated expense deposit for processing of your application.

Applications to extract minerals on lands administered by the California State Lands Commission are subject to staff review and preparation of an appropriate environmental document prior to Commission action. Information submitted will be utilized in the environmental determination. After review of the application material submitted to date, we have determined your application to be incomplete. The following information is required before we can continue processing your application:

Part I: GENERAL INFORMATION

Section C: Collection of Costs and Document Requested
Executed Reimbursement Agreement: Imperial County Planning Department is serving as the CEQA lead agency for preparation of an appropriate environmental document required by the California Environmental Quality Act and for a Reclamation Plan required by the Surface Mining and Reclamation Act. The State Lands Commission is a Responsible Agency under CEQA. Due to the complexity of your application including the commerciality determination and numerous meetings of various kinds, it is envisioned that the $5,000 approximate expense deposit will be insufficient for all the staff time required. It is estimated that staff charges associated with this work will be approximately $15,000. We request that you submit this additional $10,000 to cover staff costs to process this application only after a Reimbursement Agreement is prepared in our Sacramento office and submitted under separate cover for execution. As with the mineral prospecting permit, any unused funds will be returned to Santa Fe following consideration of your application by the State Lands Commission.

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Section E, No. 1: Although not an item of incompleteness for this application, we would recommend in your maps and cross sections for the CEQA/NEPA environmental document, that the lands which the State owns be clearly distinguished as to ownership by the State.

Section E, No. 2: This section requests information on current site conditions, including biological, cultural and scenic resources. The applicant refers the reviewer to the Plan of Operations (POO), yet the information provided in that document is incomplete or lacking. Although the POO references the Desert Tortoise, no data are provided on additional biological resources or other sensitive species (e.g. Munz's Cholla or Nelson's Bighorn Sheep) at the site or on adjacent lands. Additionally the POO does not discuss historic, cultural or scenic resources at the site. A discussion related to each issue area is needed including reference to relevant past environmental documents and resource studies.

Section E, No. 3: Please identify any additional agencies in addition to those listed in the MOU. For instance, we believe a California Department of Fish and Game 1603 Streambed Alteration Permit may be required as well as a permit or amendment from the Regional Water Quality Control Board, etc. Please provide a fully executed copy of the Memorandum of Agreement between Imperial County Planning Department, the Bureau of Land Management and Newmont Gold Company.

Section F:
No. 1: It is anticipated that Imperial County Planning Department will continue the role as CEQA lead agency and the State Lands Commission a Responsible Agency.

No. 5: According to Section B.5.2 of your proposed Mesquite Mine Closure and Reclamation Plan heap leach pads will be detoxified to a level sufficient to be assigned a Group C mining waste classification by the RWCQB prior to closure. Therefore we believe the "Yes" box for project effects would be appropriate.

Section G: Part 4
In accordance with Public Resources Code 6985 Santa Fe Pacific Gold Corporation must satisfy the Commission that commercially valuable deposits of minerals have been discovered with the limits of the permit prior to the issuance of a preferential mineral extraction lease. In our application form provided for this purpose, we included guidelines to follow for this submittal. In recognition of your expertise in this area, we would like to provide you as much latitude as possible to accomplish this task. We anticipate the format of this information will resemble a mining project feasibility study. Attached please find a copy of "Salient Factors Requiring Consideration in a Mining Project Feasibility Study" from Gentry and Hrebar, 1978; Taylor 1977. We believe that most of these items should be included in your demonstration of commerciality of the State parcel as an integral part of the Mesquite Mine.

Please include a copy of the study in which Santa Fe determined that crushing was not economically reasonable given the costs compared with recovery. Also, please discuss that process point at which the State will be paid for removal of its mineral resource.

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Include a discussion of how the ore reserves calculated on the exploratory drill hole assay data can be cross referenced or verified as mining proceeds.

Appendix B: Mesquite Mine Closure and Reclamation Plan

Page B-1, Sect. B.1.1, second objective: States that the applicant will "Return site areas . . .to conditions similar to that which existed prior to commencement of mining" yet as described on Pages B-25-26, the Plan for open-pits does not call for the return of overburden material to its original location. Please explain this inconsistency. Objective Three (Pg. B-1) and those listed on Page B-16 of this plan more accurately describe this project.

Page B-3: the Desert Tortoise is Federally listed as Threatened.

Page B-12, Sect. B.5.2: In the event that detoxification using fresh water does not work, the applicant is proposing to utilize microbial processes to detoxify the site. What are the potential environmental impacts to biological and water resources should this method be employed? How will the applicant mitigate these impacts? Has this method been approved by the Regional Water Quality Control Boards for other heap leach mines in California?

Page B-14: The applicant proposes to abandon, in place, the solution pond liners. What are these liners made of? How will the applicant verify that the liners are not contaminated with toxic materials? How long are they expected to remain in the environment? What are the potential impacts to leaving them in place versus removing them? Has abandonment in place been approved for other mine closures in California?

Page B-15, Sect. B-6: Please provide complete reference and/or reports regarding revegetation studies conducted at Mesquite Mine.

Page B-16: Please provide complete references and/or reports regarding revegetation-testing programs at the two nearby mines.

Page B-19: How long and under what conditions will the seeds, collected for revegetation, be stored prior to planting? Will the applicant conduct any seed viability studies on collected material prior to planting?

Page B-21: Please define the favorable environmental conditions under which germination is successful. How often are these conditions met? In the event, environmental conditions are such that germination is unsuccessful, explain how the revegetation plan will proceed. It appears that little if any "soil" suitable for plant growth will be available at the revegetation sites. How will the applicant aid in the development of soil, in the biological sense, to accomplish the objectives listed in this plan? What are the mycorrhizal associations required by the species proposed for use in revegetated areas?

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Page B-26: The first sentence of paragraph 2 reads "Reclamation for the pits that will remain open or partially backfilled include pit wall stabilization where necessary by excavating or blasting and depositing debris on pit floor." Please discuss the objectives of pit wall stabilization and the criteria that will be utilized to determine which pit walls will require stabilization.

Pages B-30-31: According to the Plan, reclamation success will be based on vegetation diversity, density and cover. The definition of density addresses perennial species only. Will annual species be monitored in this plan? Explain the rationale for only evaluating coverage data on annual species? Will the applicant use pre-mined conditions on those sites proposed for expansion to base reclamation success? Site selection for "control" (non-mined) sites should be selected to match as closely as possible the slope, aspect, and elevation found on the proposed revegetation sites.

Page B-31, first paragraph: Please explain why the "control sites" are to be monitored for 2 years, yet monitoring at the "impact sites" is proposed for 5 years. How does a 5-year monitoring plan relate to the life history characteristics of plant species intended for use in this revegetation plan? Finally, the first sentence on Page B-30 states that revegetated areas will be monitored for a MINIMUM of 5 years, yet the following page states a MAXIMUM of 5 years. Please clarify this inconsistency.

Page B-32: Reclamation Bond: Total estimated costs including closure and reclamation are about $8.5 million. According to B.10.2, NGC has provided financial assurances of $3,598,081. Does NGC intend to increase the bond by the estimated $5 million to assure closure and reclamation?

Upon receipt of the above information, your application will be reviewed and you will be notified of its status within 30 days. Please call Greg Pelka at (562) 590-5227 if there are any questions regarding this application.

Sincerely,

Greg Pelka for

Marina Voskanian
Chief, Planning and Development

Attachment: Salient Factors in Mine Feasibility Study

cc: Mr. Richard Cabanilla, Imperial County Planning Department (with attachment)
Mr. Kevin Marty, BLM El Centro Office (with attachment)
Mr. Marc Springer, BLM Sacramento Office (with attachment)

bcc: PBM, ADW, GJP, ELK, M. Falkner, B. Silva (all with attachment)

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SALIENT FACTORS REQUIRING CONSIDERATION IN A MINING PROJECT FEASIBILITY STUDY

I. Information on Deposit

A. Geology
1. Mineralization: type, grade, uniformity
2. Geologic structure
3. Rock types: physical properties
4. Extent of leached or oxidized zones
5. Possible genesis

B. Geometry
1. Size, shape, and attitude
2. Continuity
3. Depth

C. Geography
1. Location: proximity to population centers, supply depots, services
2. Topography
3. Access
4. Climatic conditions
5. Surface conditions: vegetation, stream diversion
6. Political boundaries

D. Exploration
1. Historical: district, property
2. Current program
3. Reserves
   a. Tonnage-grade curve for deposit, distribution classification; computation of complete mineral inventory (geological and mining reserves) segregated by orebody, ore type, elevation and grade categories
   b. Derivation of dilution and mining recovery estimates for mining reserves.
4. Sampling: types, procedures, spacing
5. Assaying: procedures, check assaying
6. Proposed program

II. Information on General Project Economics

A. Markets
1. Marketable form of product: concentrates, direct shipping ore, specifications, regulations, restrictions

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2. Market location and alternatives: likely purchasers, direct purchase vs. toll treatment
3. Expected price levels and trends: supply-demand, competitive cost levels, new source of product substitutions, tariffs
4. Sales characteristics: further treatment, sales terms, letters of intent, contract duration, provisions for amendments and cost escalations, procedures/requirements for sampling, assaying and umpiring.

B. Transportation
   1. Property access
   2. Product transportation: methods, distance, costs

C. Utilities
   1. Electric power: availability, location, ownership, right-of-way, costs
   2. Natural gas: availability, location, costs
   3. Alternatives: on-site generation

D. Land, Water and Mineral Rights
   1. Ownership: surface, mineral, water, acquisition or securement by option or otherwise, costs
   2. Acreage requirements: concentrator site, waste dump location, tailing pond location, shops, offices, changehouses, laboratories, sundry buildings, etc.

E. Water
   1. Potable and process: sources, quantity, quality, availability, costs
   2. Mine water: quantity, quality, depth and service, drainage method, treatment

F. Labor
   1. Availability and type: skilled/unskilled in mining
   2. Rates and trends
   3. Degree of organization: structure and strength
   4. Local/district labor history
   5. Housing and transport of employees

G. Government Considerations
   1. Taxation: federal, state, local
      a. Organization of the enterprise
      b. Tax authorities and regimes
      c. Special concessions, negotiating procedures, duration
      d. Division of distributable profits
   2. Reclamation and operating requirements and trends: pollution, construction, operating and related permits, reporting requirements
   3. Zoning

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4. Proposed and pending mining legislation
5. Legal issues: employment laws, licenses and permits, currency exchange, expatriation of profits, agreements among partners, type of operating entity for tax and other purposes.

H. Financing
1. Alternatives: sources, magnitudes, issues of ownership
2. Obligations: repayment of debt, interest
3. Type of operating entity: organizational structure
4. Division of profits: legal considerations

III. Mining Method Selection

A. Physical Controls
1. Strength: ore, waste, relative
2. Uniformity: mineralization, blending requirements
3. Continuity: mineralization
4. Geology: structure
5. Surface disturbance: subsidence
6. Geometry

B. Selectivity
1. Dilution, ore recovery estimates
2. Waste mining and disposal

C. Preproduction Requirements
1. Preproduction development or mining requirements: quantity, methods, time required
2. Layout and plans: schedule
3. Capital requirements

D. Production Requirements
1. Relative production (rate, procedure)
2. Continuing development: methods, quantity, time requirements
3. Labor and equipment requirements
4. Capital requirements vs. availability

IV. Processing Methods

A. Mineralogy
1. Properties of ore: metallurgical, chemical, physical
2. Ore hardness

B. Alternative Processes
1. Type and stages of extraction process
2. Degree of processing: nature and quality of products

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3. Establish flowsheet: calculation of quantities flowing, specification of recovery and product grade
4. Production schedule

C. Production Quality vs. Specifications of Product

D. Recoveries and Product Quality
1. Estimate effects of variations in ore type or head grade (trade-offs; e.g., recovery vs. grade)

E. Plant Layout
1. Capital requirements
2. Space requirements
3. Proximity to deposit

V. Capital and Operating Cost Estimates

A. Capital Costs
1. Exploration
2. Preproduction development (may also be considered operating costs)
   a. Site preparation
   b. Development of deposit for extraction
3. Working capital
   a. Spares and supplies (inventory)
   b. Initial operations
   c. Financing costs (when appropriate)
4. Mining
   a. Site preparation
   b. Mine buildings
   c. Mine equipment: freight, taxes and erection costs, replacement schedule
   d. Engineering and contingency fees
5. Mill
   a. Site preparation
   b. Mill buildings
   c. Mill equipment: freight, taxes and erection costs, replacement schedules
   d. Tailings pond
   e. Engineering and contingency fees

B. Operating Costs
1. Mining
   a. Labor: pay rates plus fringes
   b. Maintenance and supplies: quantities, unit costs
   c. Development

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2. Milling
   a. Labor: pay rates plus fringes
   b. Maintenance and supplies: quantities, unit costs
3. Administrative and supervisory
   a. Overhead charges
   b. Irrecoverable social costs

Source: Gentry and Hrebar, 1978; Taylor, 1977

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NOP

(10)

2 total

COMMENT FORM

regarding the

ENVIRONMENTAL IMPACT REPORT/ENVIRONMENTAL IMPACT STATEMENT (EIR/EIS) on the Expansion of Newmont Gold Company's Mesquite Mine, Imperial County, California.

This form is being provided for your convenience to solicit comments from interested parties on mining/environmental issues that should be addressed in the EIR/EIS document. The comment period ends on March 1, 1999. Written comments must be postmarked by this date to receive consideration. To assist you in focusing your comments, some of the key issues that are normally addressed in an EIR/EIS document are listed below. However, your comments need not address all or any of these issues, and may be directed toward issues not identified below. Furthermore, this form is not required, and you may submit your written or typed comments in any format.

Date: 1/27/99 Name: C.J. DIXON

Address: 2401 GOLD ROCK RANCH RD. #45
WINTERHAVEN, CA. 92283

Phone Number: CELLULAR
(520) 920-4848

1. The Proposed Action:

(1) DOES THE NEW BOUNDARY ENCROACH ON THE BOMBING RANGE? IF SO IT CREATES A BAD PRECEDENT FOR FUTURE EXPLORAT

(2) DOES THE EXISTING EIR/EIS FOR A LANDFILL ON THE SAME PROPERTY HAVE AN EXPIRATION DATE?

2, Reclamation:

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IMPERIAL VALLEY COLLEGE
DESERT MUSEUM
P.O. Box 430 Ocotillo, CA 92259 • Tel (760) 358-7016 • Fax (760) 358-7827 • ivcdm@imperial.cc.ca.us

VOP

13
2 tot

9 January 1999

M. Jurg Heuberger
AICP, Planning and Building Department
County of Imperial
Court House
El Centro CA 92243

Dear M. Heuberger,

Thank you for the opportunity to comment on the Proposed Mesquite Mine Expansion, Newmont Gold Company APN739-330-02-01, November 1998.

I requested Imperial Valley College Desert Museum botanist Gail Culver to review the reclamation portion of the plan. She strongly objected to the use of Brassica tournefortii in reseeding because of its tendency to spread and choke out other plants. A supportive photograph of one of the weeds is included in her review (enclosed). 1

There is no provision in the document that assures that the mining scars allowed to remain until a more affordable scenario exists will actually be removed. In such important cases, reliance on a promise of execution is inadequate. An assurance bond for future performance should be required. 2

Best regards,

Jay von Werlhof
Director IVCDM

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4 total

Jay,

I did have some questions/comments on this plan and I spoke to a Mr. Miller at BLM about a couple of things.

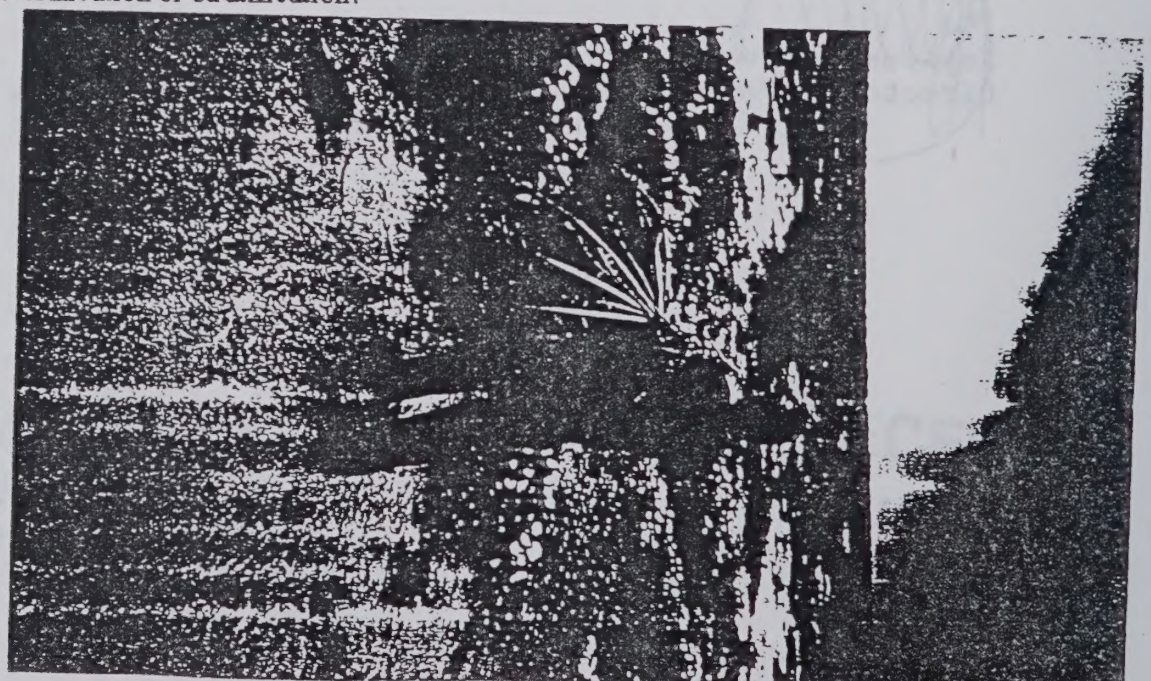
1. I am concerned about the amount of seed Mesquite says it will use for reclamation. When you add up all the amounts listed in the reclamation costs tables it comes to 7,214 pounds of seed! Mesquite says it will collect seed from land in a ten mile radius of the mine. This appears to include BLM land, bombing range, state land, and private (presumably their) land. I asked Mr. Miller if Mesquite had applied for a permit to collect seed on BLM land. He said that if the project is approved that is the permit. He was surprised at the amount of seed I quoted and I had to read it out of the plan for him. Does anybody read these things? I don't know what requirements there are (if any) for collecting on state lands or the bombing range. Given the sparsity of seed during the dry years,(we probably won't have another el Nino year for a while), will they be able to collect enough seed for their purposes while leaving enough for the animals (mice, rats, harvester ants, etc) ? what about future plant generations? Will there be any impartial supervision? The report states that if there is not enough seed available it will be purchased from local sources. Who?

2. The other thing that I really objected to was the inclusion of the weed, *Brassica tournefortii* in their list of plants to be reestablished. Mr. Miller agreed with that and said he would look into it.

There are lots of related questions that perhaps are answered in their own more detailed game plan.

3. They talk of reclamation success at other nearby mines. What do they consider success? How many perennials per acre? What diversity? American Girl mine didn't look very promising when we went to look at that old mine with you. Perhaps it's greatly improved now. Does the public get to look at an example?

4. Does their reseeding take into account seeds that need heat or cold to germinate? What about scarification or stratification?



Comment No.	Commentor — Date of Letter NOP Comment	Category	EIR/EIS Section / Remarks
	U.S. Fish and Wildlife Service — February 4, 1999		
1.	Provide a discussion of the need / purpose for the project, including each of the proposed alternatives	A	Chapter 1
2.	Provide a complete description of the planned action, including all practicable alternatives that could reduce the overall impacts.	A	Chapter 2
3.	Provide an outline of the mine s consultation history with an accurate summary of previously approved activities.	A	Chapter 3
4.	Provide a narrative (with maps, tables, and estimated acreages) on the different vegetation types that could be potentially affected.	A	Chapter 3
5.	Provide a description of the biological resources associated with each habitat type, including qualitative and quantitative assessments of resources on the project site.	A	Chapter 3
6.	Provide an inventory of the federally listed / proposed / candidate species, state listed / candidate species, and locally sensitive species.	A	Chapter 3
7.	Provide a detailed discussion of the wildlife plants, including status / distribution.	A	Chapter 3
8.	Provide an assessment of the direct, indirect, and cumulative impacts to wildlife / plant species and their associated habitat from all facets of the planned action.	A	Chapter 4
9.	Provide a table itemizing all surface disturbance (acreages) associated with the mine expansion that has either received permit approval or will require future mitigation.	A	Chapter 4
10.	Provide specific measures to fully offset mine-related impacts.	A	Chapter 4
11.	Provide an analysis of project activities on the hydrology of all ephemeral desert washes within the action s sphere of influence.	A	Chapter 4
12.	Provide identification of methods to prevent soil erosion and siltation of habitats off-site or downstream, including quantitative monitoring of direct and indirect effects.	A	Chapter 4
13.	Provide an Army Corps of Engineers evaluation for Waters of the U.S. within the project area.	A	Chapter 4
14.	Provide an identification of methods to prevent the discharge and disposal of toxic / caustic substances on the proposed site.	A	Chapters 2 and 4
15.	Provide an assessment of potential noise and light impacts on	A	Chapter 4

	wildlife.		
16.	Provide measures to mitigate adverse effects resulting from increased levels of noise and light on wildlife.	A	Chapter 4
State of California, Department of Conservation, Office of Mine Reclamation — February 2, 1999			
1.	The Surface Mining and Reclamation Act of 1975 (SMARA) Section 2772(c)(7) requires that the reclamation plan include a description of the proposed use or potential uses of the mined lands after reclamation. An end use, such as open space, must be designated.	A	Chapter 2 & Appendix B
2.	The reclamation plan should provide a discussion on what usable condition the open pits will serve upon termination of mining. If the pits will not be backfilled, the reclamation plan should explain how the open pits will be reclaimed and readily adaptable for an alternative land use.	A	Chapter 2 & Appendix B
3.	SMARA Section 2772(c)(8) requires a description of the manner in which reclamation, adequate for the proposed use or potential use will be accomplished. The reclamation plan does not provide sufficient information regarding the reclamation of each of the various vegetation types. For example, little information is provided regarding the wash habitat reclamation or proposed drainage ditch diversion. We recognize that it may be necessary to amend the revegetation mix or treatments after analysis of test plot data. Nevertheless, the revegetation plan should describe the range of treatments and species to be utilized for reclamation with the understanding that the treatments and species may change based on test plot results.	B	Chapter 2 & Appendix B
4.	The State Mining and Geology Board regulations for surface mining and reclamation practice (California Code of Regulations (CCR) Title 14, Chapter 8, Article 1, Section 3502(b)(1) requires that the reclamation plan include a description of the environmental setting of the mine site. A survey of the biotic resources on the proposed site are necessary for the following three reasons: 1. To document baseline conditions; 2. To aid in development and evaluation of an appropriate revegetation plan; and 3. To evaluate purported mining and reclamation impacts on	A	Chapter 3 & Appendix B

	sensitive species and wildlife habitat.		
5.	Prior to site disturbance, a quantitative description of the biotic setting of the site will be necessary to adequately establish baseline conditions of the site. This quantitative evaluation should include percent cover or density, and diversity measurements for each of the vegetation types that will be re-created on the reclaimed landform. Such quantitative data can also be used to guide the design of an appropriate revegetation plan.	A	Chapter 3
6.	Prior to any site disturbance, the lack of impacts to sensitive, rare, threatened, and endangered plants and animals should be verified. The revegetation of the site should be designed to minimize impacts to those species. Without knowledge of which species occur on the site, the revegetation design cannot target those species.	A	Chapter 3
7.	CCR Section 3703(a) requires that all sensitive species be conserved or mitigated. The California Department of Fish and Game (DFG) Natural Diversity Data Base lists the following species as being detected in the proposed project vicinity. If surveys detect any of these species in the project area, then formal consultation and appropriate mitigation should e developed with the agency having jurisdiction over the species; the U.S. Fish and Wildlife Service and / or the DFG. 1. Le Conte s Thrasher, *Toxostoma lecontei*, CDFG: Species of Special Concern 2. Nelson s Bighorn Sheep, *Ovis canadensis nelsoni* 3. Flat-Tailed Horned Lizard, *Phrynosoma mcalli*, CDFG: Species of Special Concern 4. Munz s Cholla, Opuntia munzii, Federal: Species of Concern, CNPS: 1B 5. Fairyduster, *Calliandra eriophylla*, CNPS: 2	A	Chapter 3
8.	Recommend that a copy of the Streambed Alteration Agreement be appended to the reclamation plan [CCR 3710(d)].	C	
9.	The reclamation plan should be supplemented with a site-specific slope stability of the final pit slopes and waste rock disposal sites.	B	Appendix B
10.	The reclamation plans should be augmented to specify final slope angles of 2:1 (horizontal to vertical) or shallower for the Overburden / Interburden Storage Areas.	B	Appendix B
11.	The reclamation plan should be supplemented with site-specific	B	Appendix B

A = Already Addressed

B = New Scoping Issue

C = Not to be Included in this EIR/EIS

N/A = Not Applicable

	sediment and erosion control criteria for monitoring compliance with the reclamation plan as required by SMARA Section 2773(a), and CCR Sections 3503 and 3706		
12.	CCR Section 3711 established mandatory standards for topsoil salvage, maintenance, and redistribution. The seeds, microbial organisms, and organic matter found in the upper six inches of growth media constitute a significant resource when used in reclamation. Successful revegetation of the site may not be possible without this resource. We recommend that the upper six inches of growth media be stockpiled and reapplied during reclamation.	A	Chapter 2 & Appendix B
13.	CCR Section 3705(g) requires that the revegetation efforts use native plant species. The reclamation plan states that Seeding will be of adapted native or naturalized plant species Table B-3 of the reclamation plan contains several species that are deleterious to the establishment of native plants. The following species are not native to the site and should not be seeded: 1. Red brome, *Bromus madritensis* 2. Mediterranean grass, *Shismus barbatus* 3. Mustard, *Brassica tournefortii*	B	Appendix B
14.	The seeding rates of these species have been omitted from Table b-3. These rates should be included for OMR review. The reclamation plan states that the seed rate is sown by volume rather by weight. Seed is sold and sown by weight, not by volume. We suggest the seed installation rate be expressed as pounds per acre.	B	Appendix B
15.	The reclamation plan states that seeds from local plants will be collected from surface soils and plants. The OMR commends the collection of local seeds, but surface seed collection can be problematic. Seeds collected from the surface of the soil are likely to contain debris or invasive species, therefore, exact seeding rates cannot be ascertained. In addition, seeds that have been collected from the soil surface may contain insects that will eat the seeds if placed in plastic bags. Proper seed storage is imperative for seed longevity.	B	Appendix B
16.	To mitigate potential visual impacts and blend the waste piles with the surrounding terrain, varnished rock hand-sized or larger could be removed from the soil surface and stockpiled. During reclamation, these rocks can be replaced on the waste piles with the varnished side	B	Appendix B

A = Already Addressed B = New Scoping Issue C = Not to be Included in this EIR/EIS

N/A = Not Applicable

	visible. Replacement of rock will also create microsites favorable to natural vegetation.		
17.	CCR Section 3705(b) requires test plots to be conducted simultaneously with mining to determine the most appropriate planting procedures. The information gained from previously developed test plots should be contained in the reclamation plan. The reclamation plan discusses several revegetation techniques that may b employed. We recommend that specific test trials be designed to determine the most effective method(s) of site revegetation, based on microsite conditions. At a minimum, the tests, should examine the effectiveness of seeding versus container plantings, the effects of different types of mulches, the effects of fertilizer, if used, and the effects of irrigation. The most effective method(s) could then be incorporated into the reclamation plan, thereby, minimizing the possibility of poor revegetation. Test plots should be located in upland, angle of repose slopes, and wash habitats. We also recommend that revegetation treatments be delineated on a plan map. Any techniques that have not been tested, such as planting young ironwood and palo verde trees or seedlings should be tested prior to implementation.	B/C	Appendix B
18.	CCR Section 3705(j) states that if irrigation is used, it must be demonstrated that the vegetation has been self-sustaining without irrigation for a minimum of two years prior to release of the financial assurances. Success criteria must be developed for any containerized plants such as ironwood or palo verde that will be irrigated to ensure that these species survive at least two years after irrigation has ceased.	A	Appendix B
19.	SMARA Section 2773(a) requires that a monitoring plan be developed that addresses topography, revegetation, and sediment and erosion control. Quantitative performance standards must be specified in the reclamation plan. The monitoring plan should discuss frequency and duration of monitoring. For revegetation elements, monitoring should be conducted until performance standards are attained. The reclamation plan states that monitoring will continue for five years. Reclamation success in arid lands often exceeds the five-year monitoring period. Monitoring should be conducted annually until performance standards are attained, with	B	Appendix B

A = Already Addressed B = New Scoping Issue C = Not to be Included in this EIR/EIS

N/A = Not Applicable

	reports submitted to the lead agency and DOC.		
20.	CCR Section 3705(m) requires that the reclamation plan include performance standards (success criteria) for each vegetation type that will be re-created that can be quantified by cover, density, species richness, and a sample size that provides a minimum 80 percent confidence level.	A	Appendix B
	California State Lands Commission — February 1, 1999		
1.	Discuss the full range of environmental issues required under CEQA.	A	Chapters 3 & 4
2.	Particular attention should be given to potential impacts to biological resources, including, but not limited to rare, endangered, and threatened plant and animal species such as the Desert Tortoise, Munz s Cholla and Nelson s Bighorn Sheep.	A	Chapters 3 & 4
	C.J. Dixon, Winterhaven, California — January 27, 1999		
1.	Does the new boundary encroach on the bombing range? If so, it creates a bad precedent for future exploration.	A	Chapter 2
2.	Does the existing EIR / EIS for a landfill on the same property have an expiration date?	C	
	United States Marine Corps, Marine Corps Air Station, Yuma, Arizona — January 25, 1999		
	Mr. Ron Pearce from the Range Department at the Marine Corps Air Station will be the point of contact for this project. He may be reached at (520)-341-3401. A copy of this project has been sent to him for review.		N/A
	Desert Museum, Imperial Valley College, Jay von Werlhof, Director — January 9, 1999		
1.	I requested Imperial Valley College Desert Museum botanist Gail Culver to review the reclamation portion of the plan. She strongly objected to the use of *Brassica tournefortii* in reseeding because of its tendency to spread and choke out other plants.	B	Appendix B
2.	There is no provision in the document that assures that the mining	A	Chapter 2 & Appendix B

A = Already Addressed B = New Scoping Issue C = Not to be Included in this EIR/EIS

N/A = Not Applicable

	scars allowed to remain until a more affordable scenario exists will actually be removed. In such important cases, reliance on a promise of execution is inadequate. An assurance bond for future performance should be required.		

· Appendix B·

Vegetation Baseline Study, Mesquite Mine Project Imperial County, California

Prepared by Bamberg Associates & Nighthawk Ecological

VEGETATION BASELINE SURVEY

MESQUITE MINE PROJECT

IMPERIAL COUNTY, CALIFORNIA

Prepared for:

Newmont Gold Company
Mesquite Mine
6502 East Highway 78
Brawley, California 92227-9306

Prepared by:

Samuel A. Bamberg, Ph.D., Bamberg Associates
Ingrid E. Hanne, M.S., Nighthawk Ecological
8344 S. Everett Way, Unit A
Littleton, Colorado 80128

September 1999
Revised March 2000

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1.0 INTRODUCTION

In this report we present the baseline vegetation analysis and potential soil salvage for the proposed Mesquite Mine expansion project for Newmont Gold Company into four areas of the mine, one previously permitted. The Mesquite Mine is an operating gold mine located in the Colorado Desert region of southern California in eastern Imperial County. The facility currently encompasses approximately 5,200 acres, and has a present disturbance of 3,700 acres under existing permits. The mine is approximately 35 miles east of Brawley in a virtually unpopulated portion of the Mesquite Mining District. The site is located adjacent to the foothills of the Chocolate Mountains. Please refer the Plan of Operations (Newmont Gold, Revision November 1999) for more discussion on operating history and project background. This report was originally prepared in Fall 1999 for four extension areas delineated in a POO, November 1998. The text and some tables have been revised (March 2000) to reflect recent proposed changes in the planned operations.

Our study involved field trips to the site to coordinate, design the program, and to conduct the vegetation and soil surveys. This baseline report presents information on the vegetation resources with emphasis on present vegetative conditions. This study provides information in sufficient detail to support state and federal environmental review and permitting requirements, and to determine impacts of proposed actions. Our quantitative descriptions include perennial plant density as required by SMARA and the California Office of Mining and Reclamation (OMR). In addition, we provide plant cover and diversity measurements and topographical information to provide a more complete description of the four expansion areas.

Soil appropriate for future reclamation activities was mapped within each of the four areas surveyed. Although no topsoil develops in this desert climate, surface soils can be used as a source of seed and limited organic residue to promote reclamation efforts. Areas with potential salvage soil were mapped and acreages calculated for this resource.

The vegetation and soil data we collected provides information for the following activities or requirements:

- support reclamation planning including revegetation success criteria
- support and supply information for an EIS

- provide species identification and estimated densities for permitting, clearing, and salvage of protected native plants

2.0 SITE DESCRIPTION

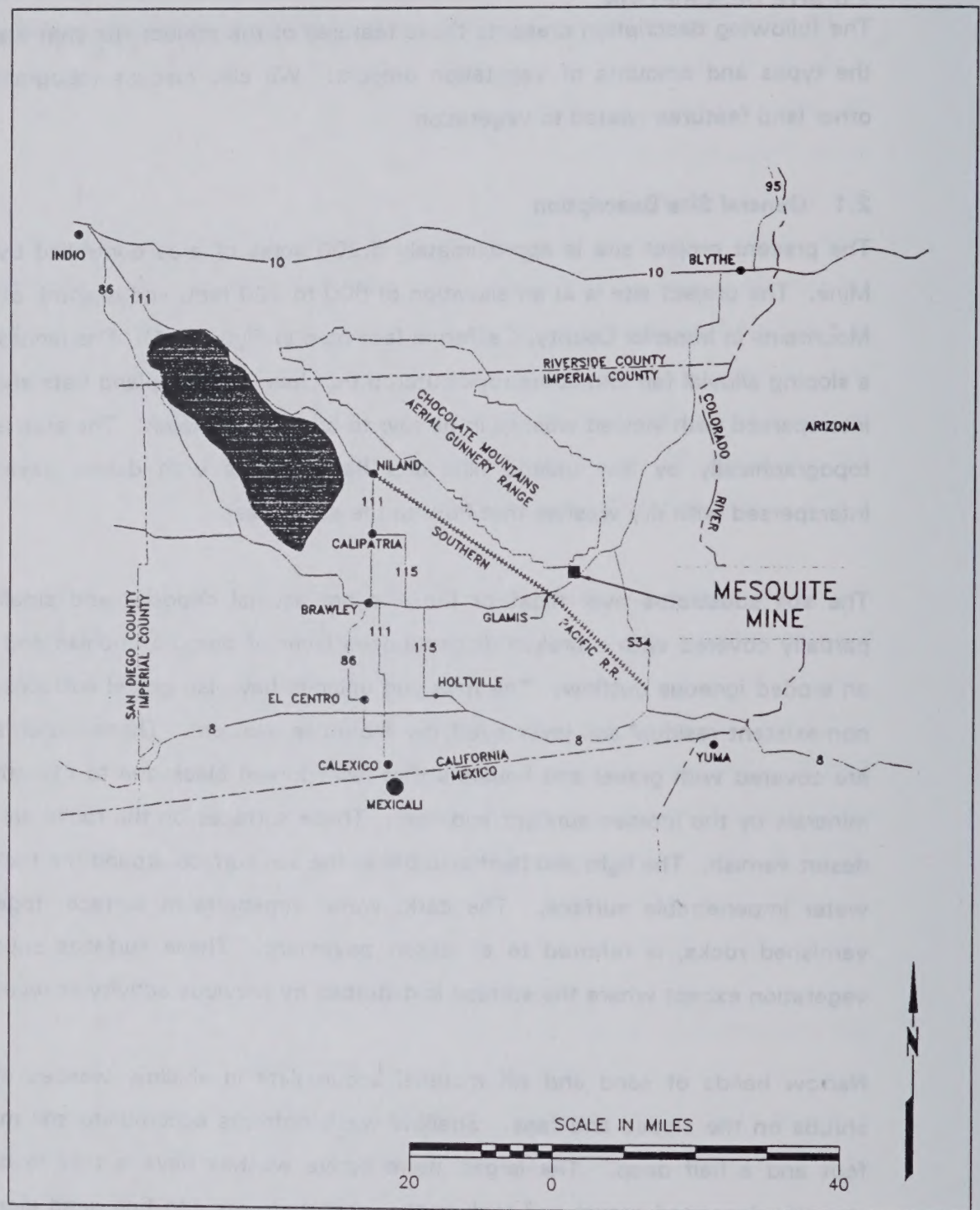
The following description presents those features of the project site that are important for the types and amounts of vegetation present. We also discuss topographic, soils, and other land features related to vegetation.

2.1 General Site Description

The present project site is approximately 5,200 acres of area controlled by the Mesquite Mine. The project site is at an elevation of 600 to 760 feet, and is south of the Chocolate Mountains in Imperial County, California (see map in Figure 2.1). The landform consists of a sloping alluvial fan and some rock outcrop that has formed upland flats and gentle slopes interspersed with incised washes in narrow to broader drainages. The area is characterized topographically by low upland hills and flat surfaces with desert pavement surfaces interspersed with dry washes that flow to the southwest.

The soil substrates over most of the site are alluvial deposits and small rock outcrop partially covered with a broken discontinuous layer of basaltic cobbles and boulders from an eroded igneous outflow. The flats and uplands have lag gravel surfaces with a thin to non-existent residual soil layer overlying the loose alluvium. These old erosional surfaces are covered with gravel and boulders that have turned black due to oxidation of the rock minerals by the intense sunlight and heat. These surfaces on the rocks are referred to as desert varnish. The light and heat also bakes the soil surface around the rocks and forms a water impenetrable surface. The dark, water impenetrable surface, together with the varnished rocks, is referred to as desert pavement. These surfaces support very little vegetation except where the surface is disturbed by previous activity or recent erosion.

Narrow bands of sand and silt material accumulate in shallow washes and underneath shrubs on the slopes and fans. Shallow wash bottoms accumulate soil material up to a foot and a half deep. The larger, more active washes have a thin to deep veneer of recently deposited gravel and rock in the wash bottoms and fine sand along the channel sides. Channels can be deeply incised in the washes, and the gravelly bottom channels support no vegetation. Sand and gravel move through the site by the flushing action of water flow following infrequent storm events. Vegetation is absent in the active channels, but is abundant on the stable banks and shallow side washes.



NO.	DESCRIPTION	BY	CHKD.	APPROVED	DATE
REVISIONS					

NEWMONT MINING CORPORATION	FIGURE 2-1 SITE LOCATION MAP		
Mesquite Mine	BY: GL	DATE: 11/99	DWG NO. FIG-001.DWG
	File: E:\100232\POO-1199\FIG-001.dwg		REV

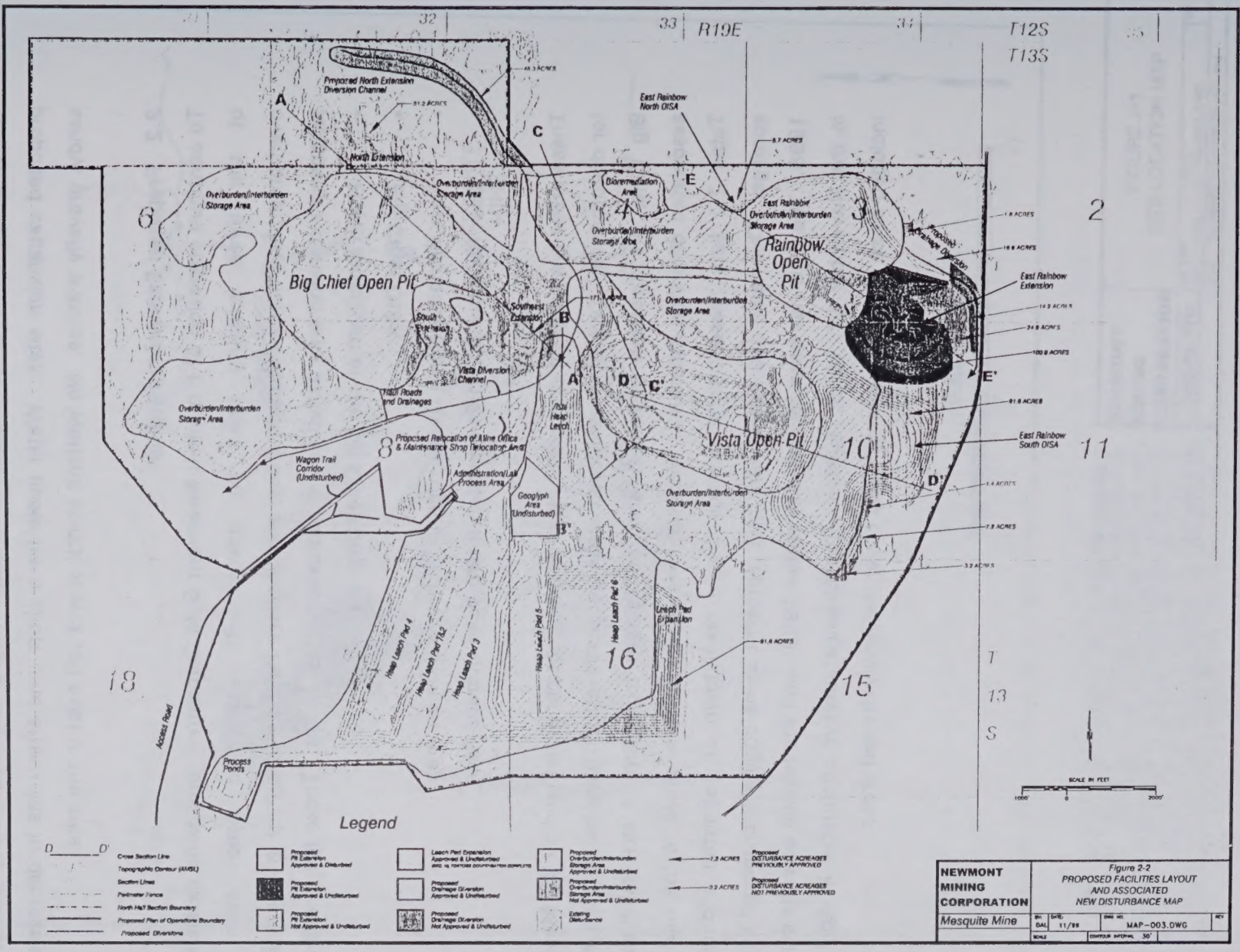
The washes are dry except for flows that occur only after storms as rainfall. No springs, seeps, or permanently wet areas or wetlands were observed during surveys on the proposed expansion sites. Water pools for a short time after rains in depressions in the sandy, gravelly washes. No wetland plants or wet soil exist in the area.

2.2 Proposed Expansion Facilities

To continue operation of the mine, Newmont Gold Company is proposing extension of two of the three existing open pit mines with associated heap leach facilities, overburden/interburden storage areas, and ancillary facilities (see map in Figure 2-2). Four proposed extension area activities are addressed in this report. These four areas are:

- North Extension of the Big Chief Open Pit
- Big Chief OISA
- East Rainbow North Overburden/Interburden Storage Area
- East Rainbow South Overburden/Interburden Storage Area

These areas are a mix of previously permitted and not permitted land by the Mesquite Mine for disturbance. Two other proposed areas not surveyed for baseline vegetation were the Big Chief pit diversion structure, and the eastern extension of the Rainbow pit with associated diversion structure. Vegetation is similar in these areas to the four surveyed. Table 2-1 lists present total acreage and a breakdown of permitted and unpermitted acreage. This table and subsequent text represent areas originally proposed in November 1998. The POO has been revised (November 1999), and the revised acreage can be found in the November 12, 1999, revision. The baseline surveys conducted in April 1999 are included since similar vegetation types cover the newly revised areas.



NEWMONT MINING CORPORATION	Figure 2-2 PROPOSED FACILITIES LAYOUT AND ASSOCIATED NEW DISTURBANCE MAP
Mesquite Mine	BY: DAL DATE: 11/99 DWG NO: MAP-003.DWG REV SCALE CONTOUR INTERVAL 30'

Table 2-1. Acreage of Extension Areas (revised to be consistent with November 1999 POO)

Extension Area	Total Acreage	Permitted (acres)	Unpermitted (acres)
North Extension of the Big Chief Open Pit	51	0	45
Big Chief OISA	0	N/A	N/A
East Rainbow North OISA	6	6	0
East Rainbow South OISA	103	99	4

Each of these extension areas is discussed for vegetation types in relation to topography and soils and potential salvage soil in Section 4.0. We didn't monitor the Big Chief Diversion Structure site, but have enough wash vegetation data to determine plant species and densities, and how to grade and form the topography. We also didn't monitor the exact locations of the Rainbow Pit Extension or Diversion Structure areas. We did monitor similar vegetation for the nearby proposed East Rainbow South OISA, and will use this area as baseline information. The Big Chief OISA will not be used or disturbed.

3.0 VEGETATION ANALYSIS AND SALVAGE SOIL MAPPING METHODS

We conducted an initial reconnaissance in April 1999 to determined qualitative characteristics of the four extension areas. This information was applied to determining vegetation types and subtypes and how to best sample this type of vegetation. We decided to first characterize these vegetation subtypes by running belt transects within representative areas. Then we mapped these subtypes within each extension area and determined how extensive each subtype was within each given area. Finally, we determined salvageable soils by a similar method: first determining what characteristics defined a salvage area, then mapping these areas within each extension site, and finally determining how much salvage soil could actually be extracted from these potential salvage areas.

3.1 Determination of Vegetative Types and Subtypes Within Four Extension Areas

We traversed each of the four extension areas to determine the general characteristics of each site. Topography, numbers and sizes of washes, vegetation community changes, and soil types were all noted. This qualitative, baseline information was recorded. We

obtained a mine site aerial photograph for an aerial view and to help with mapping. Each area was mapped to identify vegetation types, size and location of washes, and areas of potentially salvageable soil.

3.2 Vegetation Transects Within Vegetative Subtypes

We adapted field survey methods to sample the type of desert vegetation present in the study area and to increase the data's usefulness in determining shrub density, estimating cover and calculating diversity. The quantitative vegetation survey technique we used was belt transects of linear plots laid end to end along straight compass lines and oriented parallel to the slopes and gradients. The vegetation type and patterns were qualitatively related to the abiotic factors of topographic position, washes and erosion features, and soil types. Each transect was made up of 10 or 12 plots of variable size. Washes were sampled by paired plots aligned perpendicular to both sides of the channel at regular intervals of 50 or 100 feet. In each plot, vegetative variables were recorded on standardized field data forms.

We conducted the quantitative field surveys in April and August 1999. Since the sample plots were primarily for perennial plant density, the time of year for sampling was not critical. The locations, number of samples, variables recorded, and data analysis methods were determined as described below.

Sampling Locations

Belt transects were located to sample the major vegetation types in topographic locations typical for each expansion area. Washes were sampled along relatively stable or undisturbed sections.

Number of Samples

Generally ten plots per linear transect were sampled in each of the vegetation types. The numbers of transects were adjusted for sample adequacy.

Variables

The variables were chosen to determine vegetation characteristics. The variables in the transects measured for vegetation were:

- total number of shrubs (for density)
- percent cover by each plant species (visual estimate)
- vegetative diversity (number of species present)

Individual shrubs by species were counted in each plot. The percent cover of each plant species within each linear plot was determined by a visual estimation technique. We grouped all the plants of one species as a unit and visually assigned a cover.

We analyzed transects for the vegetation parameters of density, ground cover, and diversity. Total vegetative ground cover was determined by averaging the estimated cover for all plots in each transect. Perennial shrub and tree densities were calculated by adding up the shrub/tree counts in each plot, averaging this number for all plots in a transect, and then adjusting this average per transect to an acre basis. Diversity was the total number of perennial plant species (shrubs, cactus, trees, and perennial herbs) recorded in all transects in a given vegetative type.

3.3 Salvage Soil Determination

Topographic and vegetative characteristics that promote the formation of salvage soil were recorded during our site visit. Characteristics we used were absence of desert pavement, a layer of soil with a sandy or loamy texture, and accessibility to equipment. We noted the locations that had these characteristics within the four proposed expansion areas and determined what percent of these locations would have soil that would meet the criteria for being salvageable. We then mapped these salvage areas using ground surveys and aerial photographs of the four expansion areas. Total acreage of the salvage areas was reduced by the percent of potential salvage soil within these salvage areas.

4.0 RESULTS OF VEGETATION SURVEYS

Vegetation on the project study area is typical for this hot, dry desert region of southern California. The vegetation consists of drought resistant perennial species, and annual species that germinate after sufficient rains. In this section, we present the results of the

qualitative and quantitative field surveys conducted. Vegetation types and characteristics are discussed in relationship to topography, soils, and other abiotic factors. The plant community analysis and vegetation parameter of concern, density, for determining reclamation success are calculated and presented.

4.1 General Vegetation Description

The vegetation on the project site is low desert scrub typical of the severe temperate desert areas. The low rainfall (annual average of about 4 inches measured during the past 10 years) and the high daytime temperature (up to 115 degrees Fahrenheit in the summer) of the project area impose special requirements on the plant life. Vegetative cover is extremely low and species diversity is minimal. The existing vegetation is highly adapted to the desert heat and droughts. The vegetation community on the entire study area outside the washes is a mixed desert scrub characterized by *Larrea tridentata* (creosote bush) and *Ambrosia dumosa* (burrobush). The perennial shrubs are the dominant vegetation, with a few herbaceous perennials present. Cover and productivity by annual species is dependent on seasonal moisture. In particular, the seasonal timing and amounts of rain are important. Autumn rains generally germinate the annuals, and late winter and spring rains promote growth. Precipitation was low this year during the growing season from September 1998 through August 1999, so tree/shrub growth was low and annual germination non-existent.

Previous human use impacting vegetation in the project site included roads, access trails and some previous trenching for exploration in the proposed north extension of the Big Chief Pit. Plants have been periodically collected or cut. Many of the older ironwood trees had been cut and were left as old stumps or resprouted bases on sides of washes in portions of the project site. The US Army conducted maneuvers in this area during WWII, and their tracks are still evident.

A list of the plant species found on the Mesquite Mine site is given in Table A-1, Appendix A (nomenclature according to The Jepson Manual: Higher Plants of California, 1993, James C. Hickman, editor, University of California Press, Berkeley and Los Angles, California). The floristics of this area is typical for the southern hot (subtropical) California desert region. This is a low desert region with few frosts. There was a total of 105 plant

species listed as observed on or near the project site, but this is not a complete list for all species present. There were no unusual plant assemblages or sensitive plant species present, except for *Calliandra eriophyllum* (fairy duster). There were several cactus species observed, and some species were fairly abundant such as *Opuntia bigelovii* (teddy-bear cactus). There are a few introduced species of plants, mainly grasses and mustards, such as *Bromus tectorum* (downy chess) and *Brassica tournefortii* (mustard), which have become naturalized in the flora of the deserts.

North Extension of the Big Chief Open Pit

An extension of the existing Big Chief Open Pit Mine toward the north would extend into the northern half of Section 5 of T13S, R19E. The proposed extension would occupy 51 acres. Part of this area is the site of previous mining activity and is disturbed by roads. A large, braided wash flows from the north and is channeled into the existing drainage diversion that flows to the east and then south of the mine site. Some low hills with upland vegetation transect this area from the northwest tapering down to the south central portion. The remaining sections of this area are a relatively flat desert pavement interspersed with a few shallow washes.

Big Chief Overburden/Interburden Storage Area

This area is located immediately to the east of the existing Big Chief Open Pit intersecting the corners of Sections 5, 6, 7, and 8 of T13S, R19E. It is composed entirely of upland vegetation within low hills on a deep alluvium. The hillside soils are stable and water penetration is minimal. This results in low vegetation density and no washes with associated plant communities. This area was eliminated for overburden/interburden storage in the November 1999 revision.

East Rainbow North Overburden/Interburden Storage Area

Overburden/interburden from extension of the Rainbow Open Pit would be stored in two possible areas. One area is to the north of the existing East Rainbow Overburden/Interburden Storage Area located in Sections 3 and 4 of T13S, R19E. It would occupy 6 already permitted acres. The majority of this site is desert pavement interspersed with several shallow to medium washes. Several roads traverse the area as well as a few of General Patton's tank tracks.

East Rainbow South Overburden/Interburden Storage Area and East Rainbow Pit Extension

The area for the East Rainbow South overburden/interburden would be an extension of an existing storage area to the east of the Vista Open Pit Mine. Portions of this area have been previously permitted. This area is located in Section 10 of T13S, R19E and would occupy 103 acres, only 4 acres of which are unpermitted. Drainage across this area on an alluvial bajada has been interrupted due to the realignment of Highway 78 and a large berm around portion of the area. This road and a large berm has disrupted seasonal flow of the complex of washes across this site, and is slowly changing the composition of the vegetation to a drier upland type. The East Rainbow Pit Extension is upslope on the same drainage alluvial bajada as the East Rainbow South OISA. The vegetation is similar in species composition and density.

4.2 Vegetation Types and Subtypes

The vegetation in this portion of the Colorado Desert is generally typed into one category, the creosote shrub type. For this report and reclamation purposes, we have divided the vegetation types in all locations of natural or semi-natural state into two main types. These are:

- shrub/scrub vegetation type on the open, drier alluvial flats and slopes
- tree/shrub vegetation type (microphyll woodland) in drainages and on sides of washes

Refer to maps in Figure 4-1 to 4-4 for a delineation of these types in each expansion area surveyed in mid-1999. The shape and size of these areas were changed in November 1999. The shrub/scrub vegetation type is typical of the creosote type with shrubs being dominant and widely spaced. The tree/shrub vegetation type reflects the higher moisture availability in washes and drainages that results from rain run-off events. The vegetation in shallow washes and on sides of larger washes has greater diversity, variability, and ground cover.

The vegetation within each type differs in species distribution and abundance by location within the site, partly due to segregation of species into topographic features. There are broad patterns of vegetation related to topographic controls of soils and moisture. We have further divided the two vegetation types into subtypes based on species abundance due to their topographic positions.



Figure 4–1
Vegetation Types on the Big Chief Open Pit North Extension Area

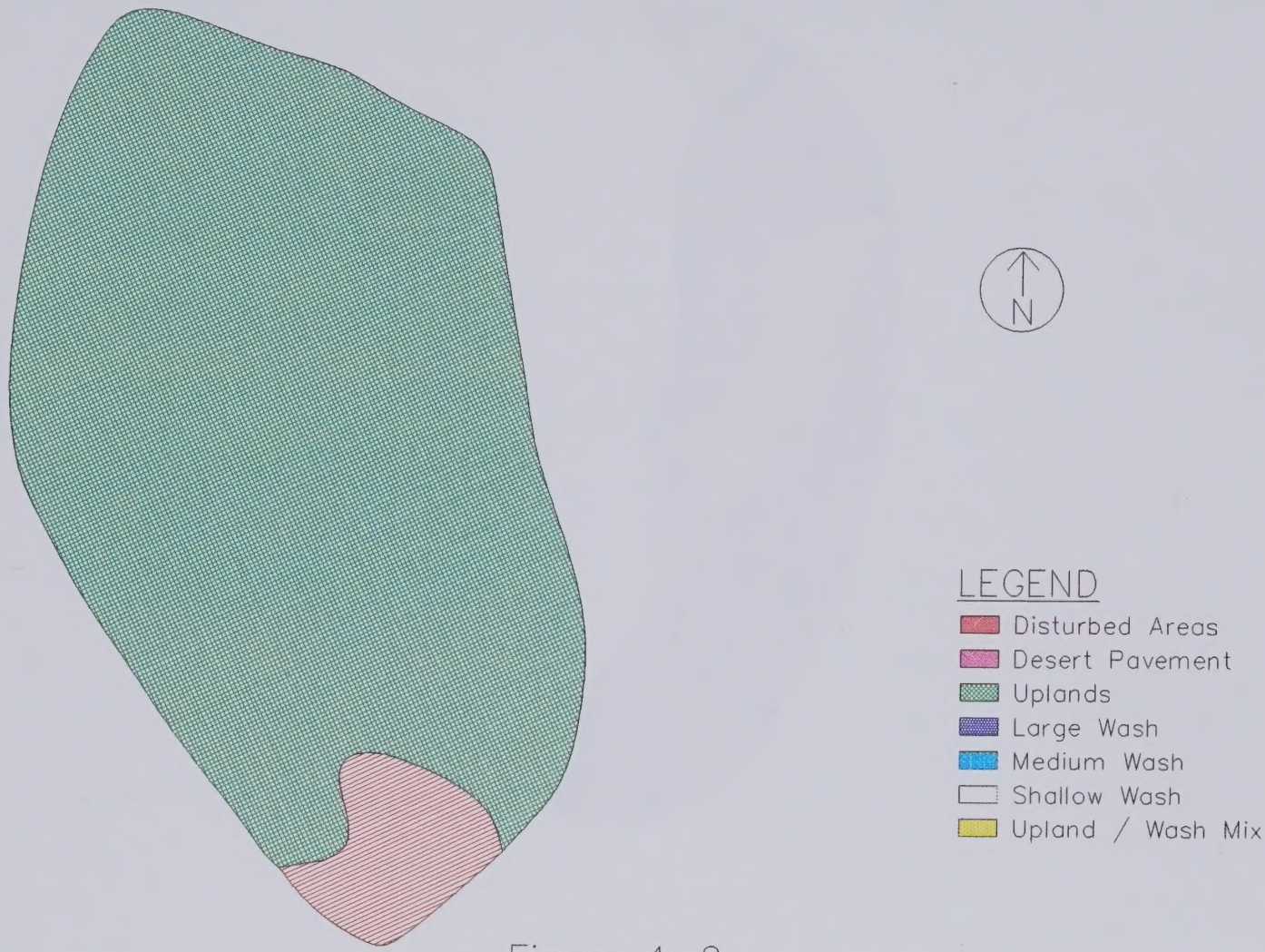
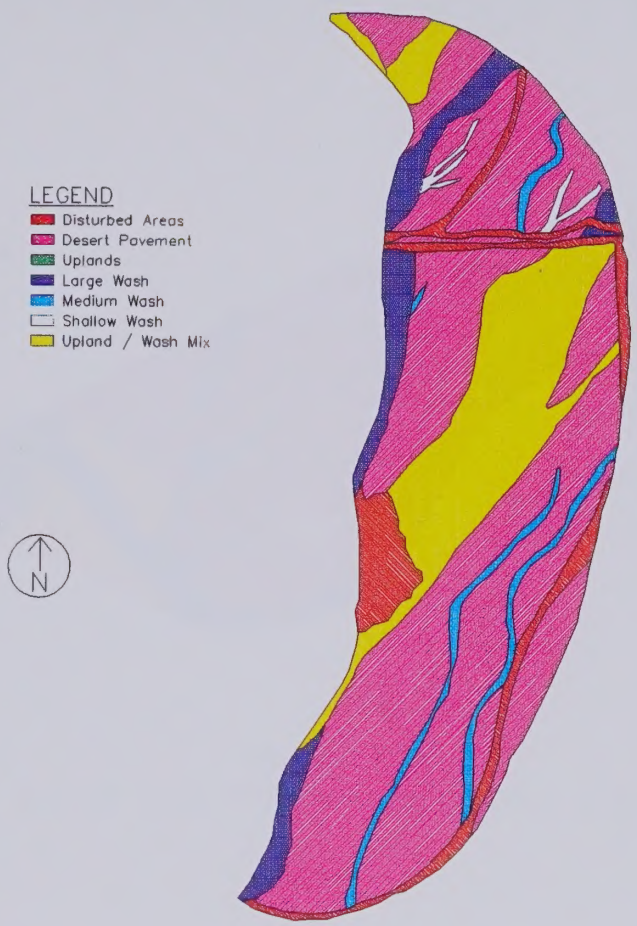


Figure 4–2
Vegetation Types on the Big Chief OISA Expansion Area


LEGEND
Disturbed Areas
Desert Pavement
Uplands
Large Wash
Medium Wash
Shallow Wash
Upland / Wash Mix
N

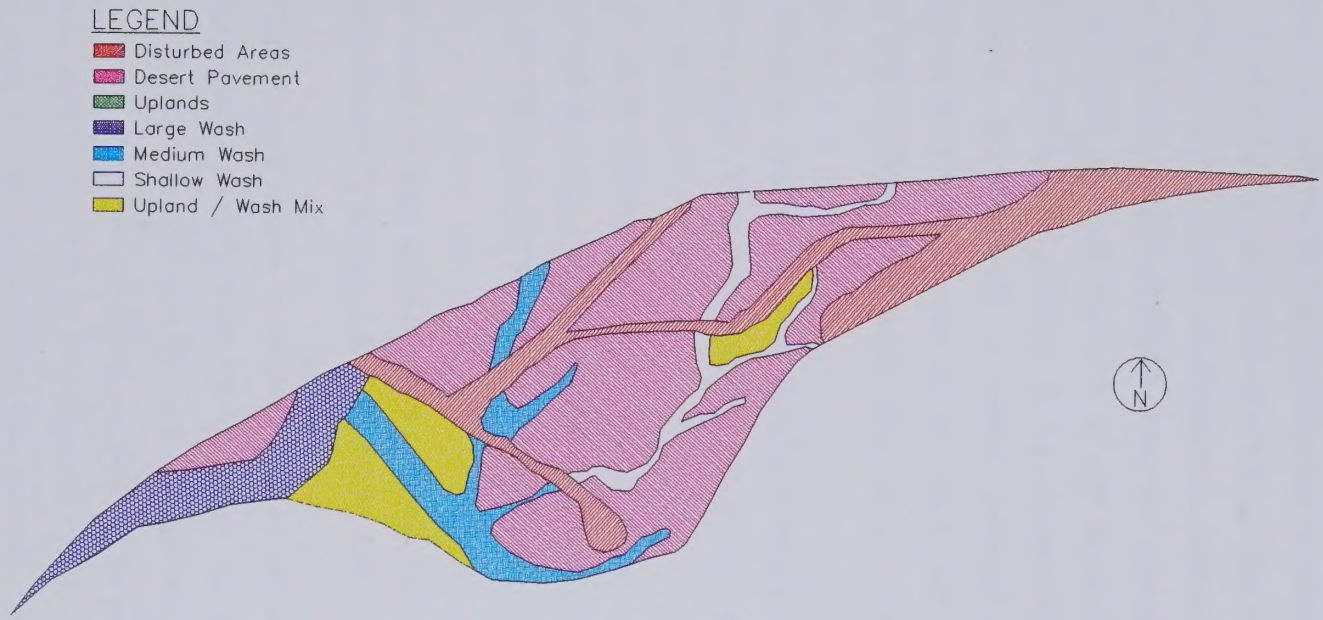


Figure 4–4
Vegetation Types on the East Rainbow North OISA Expansion Area

4.2.1 Shrub/Scrub Vegetation Type

The open, dry alluvial flats and gentle slopes have a shrub/scrub vegetation type, which consists of widely spaced low shrubs and cactus. The major species of shrubs measured in transects were in order of abundance: *Ambrosia dumosa* (burrobush), *Larrea tridentata* (creosote bush), *Encelia farinosa* (inciensio), and *Opuntia bigelovii* (teddy-bear cholla). This type occupies most of the area on the expansion sites, and includes all of the desert pavement areas. On portions of the alluvial flat and slope areas, desert pavement has developed. On this desert pavement, perennial plants do not grow and total vegetative ground cover is almost non-existent (less than 0.1%). The shrub/scrub vegetation is spotty and variable in distribution and species dominance.

As a basis for vegetation typing in the reclamation planning, we identified four topographic subtypes of shrub/scrub vegetation type, these are:

- desert pavement
- upland slopes
- upland slopes and desert pavement complex
- alluvial flats and shallow wash complex

The expansion areas, being in close proximity to the mine and the former highway location, are complicated by disturbance from roads, historical mining, and recent exploration.

Desert pavement occurs on alluvial flats on old undisturbed surfaces and covers much of the sites except the Big Chief OISA. These flat to shallow sloping sand and rock surfaces weather in-place by the sun and arid climate and form an impenetrable surface with high salt content. We estimate these surfaces to be between 1,000 and 10,000 years old, and cover an estimated 45% of the uplands. Vegetation is extremely sparse, and water and seeds generally cannot penetrate the surface. This subtype will not serve as a basis for reclamation planning since the soil and surface conditions cannot be restored during mine reclamation.

Upland slopes have some rock outcrop and thin or no soil. This type occurs on two of the extension areas on the north and west portions of the mine. Density of the vegetation is

very low and is clumped along valley bottoms. The rocks have been highly baked by the sun and arid climate.

Desert pavement and upland slopes complex occurs in most upland areas and covers approximately 15% of the uplands and flatter slopes. These are areas within the desert pavement topography that have had their alluvial surfaces disturbed by erosion or deposition within the last 1,000 years. They are interspersed with desert pavement surfaces. Spacing of the plants is clumped and clumping is dependant on soil type, topographic position, and water availability.

Alluvial flats and shallow wash complex occurs on the eastern portion of the mine site on the gently sloping bajada. This subtype covers fairly extensive areas within this region of the desert. This subtype covers about 10% of the eastern sections of the mine. Roads and fences cross this locale and portions of OISA are on and around the area.

4.2.2 Tree/Shrub Vegetation Type

The tree/shrub vegetation type commonly occurs in the smaller drainages and tributaries and in the major and braided washes. In the major and braided washes, this vegetation type occurs on the sides and banks created by the major water runoff from the upslope large drainage basins during significant precipitation events. Flooding and washing of the old alluvial material creates channels and disturbs the old, weathered surfaces. This allows better penetration of water and seed, and permits a higher cover than on the shrub/scrub vegetation type. A greater variety of plant species and a higher abundance of plants are the results. The major species include those found in the shrub/scrub vegetation type plus other species of trees and shrubs that occur principally in the washes. This type covers a small percentage of the four expansion sites at about 7%. We identified three topographic subtypes of shrub/scrub vegetation type based on the width and depth of the washes:

- broad major washes
- medium subsidiary washes
- shallow subsidiary washes

Broad major washes form in the drainages that cross the study area and continue out onto the broad alluvial flats southwest toward the Algodones Dunes. These washes vary from

almost flat to 15 feet deep and 8 to 60 feet (average 40 feet) wide. The sides of the washes are sandy and support trees and plants (normally above the high water mark), and occasional islands of thick vegetation form on raised islands of the wider sandy bottoms. Trees associated with the major washes include *Olynea tesota* (ironwood) and *Cercidium floridum* (palo verde), and several species of shrubs that occur mainly in washes such as *Bebbia juncea* (sweetbush) and *Hyptis emoryi* (desert lavender).

Medium subsidiary wash vegetation is similar to that in the major washes, and is equally as diverse and abundant including most of the upland species on the edges. The washes are narrower (average 30 feet) and not as deep or broad, and have some finer soils washed or deposited in them. There are fewer and smaller trees. *Pleuraphis rigida* (big galleta), *Asclepias subulata* (ajameta-milkweed), *Calliandra eriophylla* (fairy duster), and *Hibiscus denudatus* (rose mallow) are additional species present. Vegetative cover is irregular on the bottoms and sides.

Shallow subsidiary wash vegetation is similar to uplands in species diversity, but also include a few additional species such as *Krameria* spp (desert ratany) and *Ditaxis* spp (ditaxis).

4.3 Results of Quantitative Vegetation Surveys

The results of the vegetative transect survey are presented in the following sections. The identification and location of the transects are given in Table 4-1.

4.3.1 Perennial Plant Density

Perennial plant densities by species for each vegetative subtype are presented in Table 4-2. The density of shrubs and trees was widely variable depending on the vegetative subtype. The lowest density of perennial plants was on the desert pavement where typically only annual herbaceous plants grow in the wetter years. The next lowest density was in the desert pavement and upland shrub/scrub complex at 85 plants per acre. The highest was in the shallow washes at 1,655 plants per acre.

The most common shrubs as indicated by the densities (Table 4-2) are in order of abundance *Encelia farinosa* (incienso), *Ambrosia dumosa* (burrobush), *Larrea tridentata*

(creosote bush), and the cactus *Opuntia bigelovii* (teddy-bear cholla). The two common tree species, *Olneya tesota* (desert ironwood) and *Cercidium floridum* (palo verde), are mostly confined to washes at relatively low densities. Palo verde was not rooted in any of our transects although it is present within the washes.

4.3.2 Perennial Plant Cover and Diversity

Perennial plant diversity and cover by vegetative subtype is presented in Table 4-3. The average cover for all vegetation measured in the vegetative subtypes varied from to 0 to 0.1% in desert pavement to 25% in medium washes (see Table 4-3). The majority of perennial cover is by shrubs. The plant cover is more uniform on the shrub/scrub vegetation type generally varying less than 1% between transects within any subtype. The exception is in the alluvial flats and shallow wash complex where the shallow washes have up to 37% cover compared to no cover on some areas of the flats.

The highest number of perennial plant species per subtype was 16 in the shallow washes and the lowest was 0 in the desert pavement, then increases to 6 in the upland slopes. This is a medium to low diversity for desert vegetation and is typical for this lower desert region. This desert with extremely low rainfall requires highly adapted plant species, especially for perennial species. The wide spacing of plants allows for maximum water availability for individuals. The large size of our plots maximized the diversity index.

Vegetation Determination Within Four Expansion Areas

Vegetation subtypes were mapped within each of the four extension areas (see Figures 4-1 to 4-4). All of the sites have disturbance areas without vegetation. The disturbance is generally roads but also include dump areas and scraped sites. Table 4.4 gives the plant density by vegetation subtype for each of the four extension areas. Table 4.5 lists plant cover and diversity by vegetation subtype for the four areas.

Table 4-1. Identification and Locations for Baseline Vegetation Surveys for Mesquite Mine, 1999

Vegetation Subtype (Location)	Transect No.	Survey Date	Size (in meters)			No. of plots
			width	Length	total (m^2)	
Upland Slope (Big Chief OISA)	BC-1	4/24/99	6	100	600	10
	BC-2	4/24/99	6	100	600	10
	BC-3	9/1/99	6	100	600	10
	BC-4	9/1/99	6	100	600	10
Desert Pavement & Upland Complex (Big Chief North Extension)	NE-1	4/22/99	6	100	600	10
	NE-2	4/22/99	6	100	600	10
	NE-3	9/1/99	6	100	600	10
	NE-4	9/1/99	6	100	600	10
Alluvial Flats & Shallow Wash Complex (East Rainbow South OISA and Pit Extension)	ERS-1	4/24/99	6	100	600	10
	ERS-2	4/24/99	6	100	600	10
	ERS-3	9/2/99	6	100	600	10
	ERS-4	9/2/99	6	100	600	10
Large Wash (Big Chief North Extension)	NEW-1	9/1/99	6	50	300	9
	NEW-2	9/1/99	6	50	300	10
Medium Wash (East Rainbow North OISA)	ERN-2	9/2/99	10	25-45	340	10
Shallow Wash (East Rainbow North OISA)	ERN-1	4/24/99	10	30	300	10

Table 4-2. Perennial Plant Density by Vegetative Subtype, Mesquite Mine 1999

Plant Species	Shrub/scrub				Tree/shrub (washes)		
	desert pavement	upland slopes	pavement & upland	flats & washes	Large	medium	shallow
Trees							
Olneya tesota	0	0	0	4	0	0	29
Shrubs							
Acacia greggii	0	0	0	0	0	13	0
Ambrosia dumosa	0	83	13	145	84	218	566
Bebbia juncea	0	0	0	0	31	0	0
Calliandra eriophylla	0	0	0	2	0	269	116
Encelia farinosa	0	38	22	64	138	372	421
Fouquieria splendens	0	0	0	4	0	13	29
Hibiscus denudatus	0	0	0	5	0	26	29
Hymenoclea salsola	0	0	0	0	31	0	0
Hyptis emoryi	0	0	0	2	23	0	0
Krameria erecta	0	0	0	0	0	0	29
Larrea tridentate	0	83	31	49	53	64	44
Lycium andersonii	0	0	0	0	69	0	15
Psorothamnus schottii	0	0	0	0	0	0	15
Stephanomeria pauciflora	0	0	0	0	0	0	15
Grass							
Pleuraphis rigida	0	0	0	0	0	26	131
Herbaceous							
Fagonia laevis	0	0	0	0	8	0	116
Cactus							
Echinocactus polycephalus	0	7	2	0	0	0	0
Opuntia acanthocarpa	0	0	4	7	23	0	0
Opuntia basilaris	0	9	5	2	31	0	29
Opuntia bigelovii	0	0	9	20	0	0	58
Opuntia echinocarpa	0	0	0	4	8	13	0
Opuntia pencilatus	0	0	0	16	0	0	15
Total density	0	348	221	85	497	1012	1655

Table 4-3 Plant cover and diversity by vegetation subtype, Mesquite Mine 1999.

Vegetation subtype	Plant cover* (%)	Diversity
Shrub/Scrub Vegetation Type		
desert pavement	0	0
upland slopes	3	6
desert pavement & upland	1	10
flats & shallow wash	5	13
Tree/Shrub Vegetation Type		
wash – large	11	15
wash – medium	25	12
wash – shallow	23	16

Table 4-4 Density for each area by vegetation subtype with percent of each vegetation subtype, Mesquite Mine 1999.

Survey site	Vegetation subtype	Subtype as % of total site	Vegetation subtype size (acres)	Density (plants/acre)
Big Chief North Extension (51 acres)	desert pavement	16	9.2	0
	desert pavement & upland	33	14.7	85
	flats & shallow wash	5	2.8	348
	Wash – large	12	5.5	497
	Wash – medium	2	0.9	1012
	Disturbed	32	12.9	--
Big Chief OISA (0 acres)	Upland	93	18.5	221
	Disturbed	7	2.5	--
East Rainbow South OISA (103 acres) East Rainbow Pit Extension (25 acres)	desert pavement	60	78.1	0
	flats & shallow wash	19	19.9	348
	Wash – large	7	9.9	497
	Wash – medium	4	2.5	1012
	Wash – shallow	1	1.2	1655
	Disturbed	9	12.4	--
East Rainbow North OISA (6 acres)	desert pavement	50	13.2	0
	flats & shallow wash	9	2.2	348
	Wash – large	9	1.7	497
	Wash – medium	8	1.1	1012
	Wash – shallow	5	0.7	1655
	Disturbed	19	3.1	--

Table 4-5 Plant cover and diversity for each area by vegetation subtype, Mesquite Mine 1999.

Survey site	Vegetation subtype	Plant cover* (%)	Diversity
Big Chief North Extension	desert pavement	0	0
	desert pavement & upland	1	10
	flats & shallow wash	5	13
	wash – large	11	15
	wash – medium	25	12
Big Chief OISA	Upland	3	6
East Rainbow South OISA – Pit Extension	desert pavement	0	0
	flats & shallow wash	5	13
	wash – large	11	15
	wash – medium	25	12
	wash – shallow	23	16
East Rainbow North OISA	desert pavement	0	0
	flats & shallow wash	5	13
	wash – large	11	15
	wash – medium	25	12
	wash – shallow	23	16

* Plant cover does not include canopy overlap.

North Extension of the Big Chief Open Pit

This site has five vegetative subtypes. Most of the site is a desert pavement and desert pavement upland mixed type (photograph P-1 in Appendix B). Plant density for these vegetation subtypes is low so the weighted average plant density for the site is 128 plants/acre.

Big Chief Overburden/Interburden Storage Area (not disturbed)

This is the least complex site with only one disturbance area covering 2½ acres. The site is an upland slope (see photograph P-2) with plant density at 221 plants/acre, 3% plant cover, and 6 species of plants within our transects. This gives a weighted plant density average of 195 plants/acre.

East Rainbow North Overburden/Interburden Storage Area

Although this is a smaller site, it has a high complexity. The majority (60%) of the site is desert pavement with extremely low plant density. However, traverse this site with smaller washes grading into medium washes with different flow directions (see photograph P-3). The weighted average plant density for this site is 176 plants/acre.

East Rainbow South Overburden/Interburden Storage Area and Pit Extension

This is the largest area surveyed. Most of this site (63%) is desert pavement. One large swath through the middle of the site is a complex of alluvial flats and shallow washes (see photograph P-4). A large flat wash flows along the east side of the site. The weighted average plant density for this site is 132 plants/acre.

4.4 Salvage Soils

These extreme desert soils do not have any topsoil as is generally used during reclamation activities in more temperate climates. The very low, sporadic precipitation (about 4 inches per year long-term average) results in a very low plant cover and therefore very little organic input into the soil. In addition, the high temperatures and solar irradiance bake the soil, forming a generally water-impermeable surface. These soils do not form soil horizons or differentiated layers. Much of the organic matter is collected and utilized by ants, termites, and small mammals. Decomposition of the limited litter that exists is very slow and nutrients are quickly reutilized.

In the large and medium washes, the soil surface is disrupted by infrequent, but heavy, water flows. This water action breaks up the impenetrable soil surface but disrupts any soil formation. In the shallower washes, water flow is less vigorous and water collection is higher and therefore plant densities are higher. However, the gravelly, sandy texture of the soil does not allow for good water holding capacity. So the effective water input is still extremely low and sporadic.

Some soil can be salvaged from the shallow and medium washes, litter and fine soil deposition areas of the large washes, and underneath larger trees and shrubs. These areas have soils with finer textures and a higher amount of litter and organics. They also contain high numbers of seeds. These soils can be salvaged and used in reclamation activities.

Areas of potential soil salvage were mapped within three of the four extension areas (see Figures 4-5 to 4-7). The eliminated upland steep Big Chief OISA area had no salvageable soil. Table 4.6 lists percent of salvage areas and total probable salvage soil amounts for each extension area. Soil can be salvaged to a depth of 6 to 12 inches, so an average 9-

inch depth was used in calculations. The North Extension of Big Chief Pit would yield about 3.2 acres total of salvage soil. The East Rainbow OISA's would yield 0.4 and 11.5 acres of salvage soil for the North and South areas, respectively. Soil can also be salvaged from the two extension areas not surveyed, the Big Chief Diversion Structure and East Rainbow Pit Extension, at approximately the rate of 7% of the area.

Table 4-6. Soil Salvage for Extension Areas, Mesquite Mine, 1999

Location	Total site acreage	Salvage area as % of total site	Salvage soil extent[1] (acres)	Total volume of salvage soil[2] (cubic yards)
Big Chief North Extension	51	21%	3.2	3,870
Big Chief OISA	21	0%	0	0
East Rainbow South OISA and Pit extension	128	30%	11.5	13,915
East Rainbow North OISA	6	22%	0.4	485

1. site acreage X salvage area % X 30% (typical) salvageable material
   e.g. 30% X 21% = 6.3% X 51 acres = 3.2 salvageable
2. salvage soil to an average depth of 9 inches

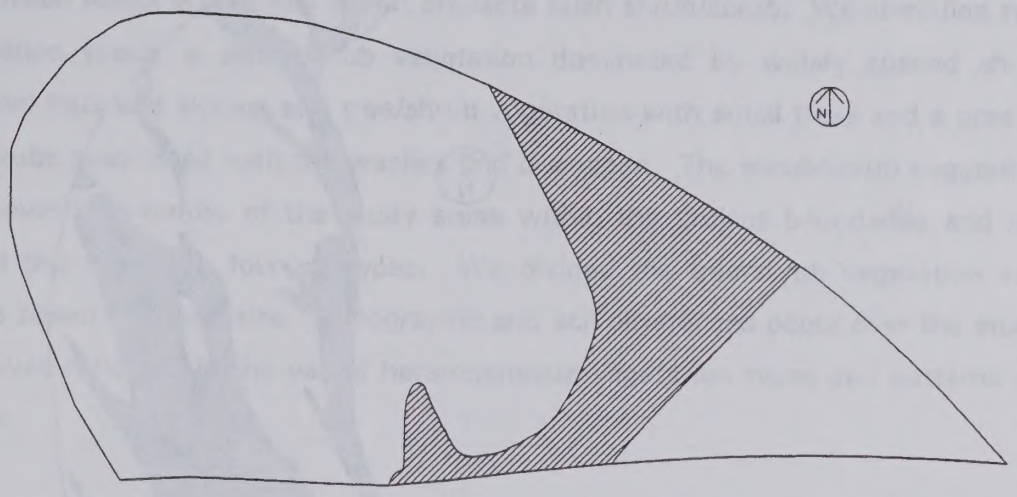


Figure 4–5 Soil salvage potential for the North Pit Extension area.
Mesquite Mine, October 1999

▨ Area with potential soil salvage.

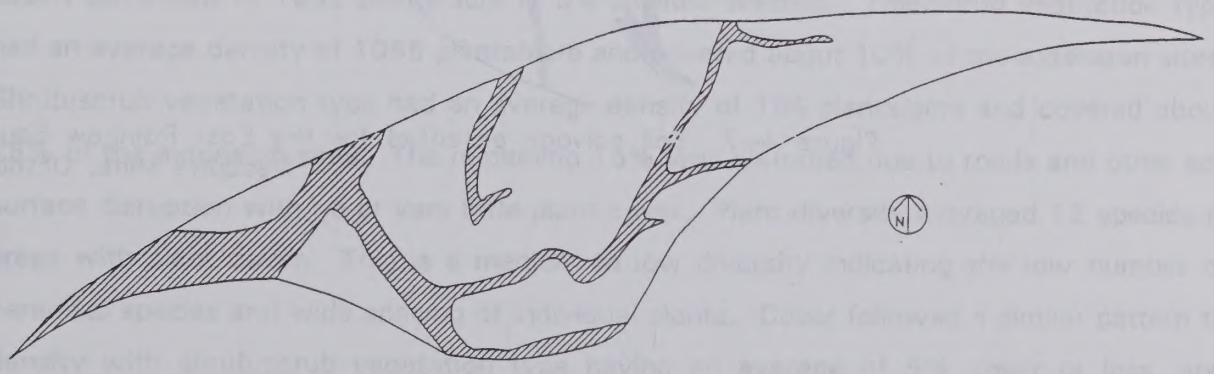


Figure 4–6 Soil salvage potential for the East Rainbow North OISA.
Mesquite Mine, October 1999

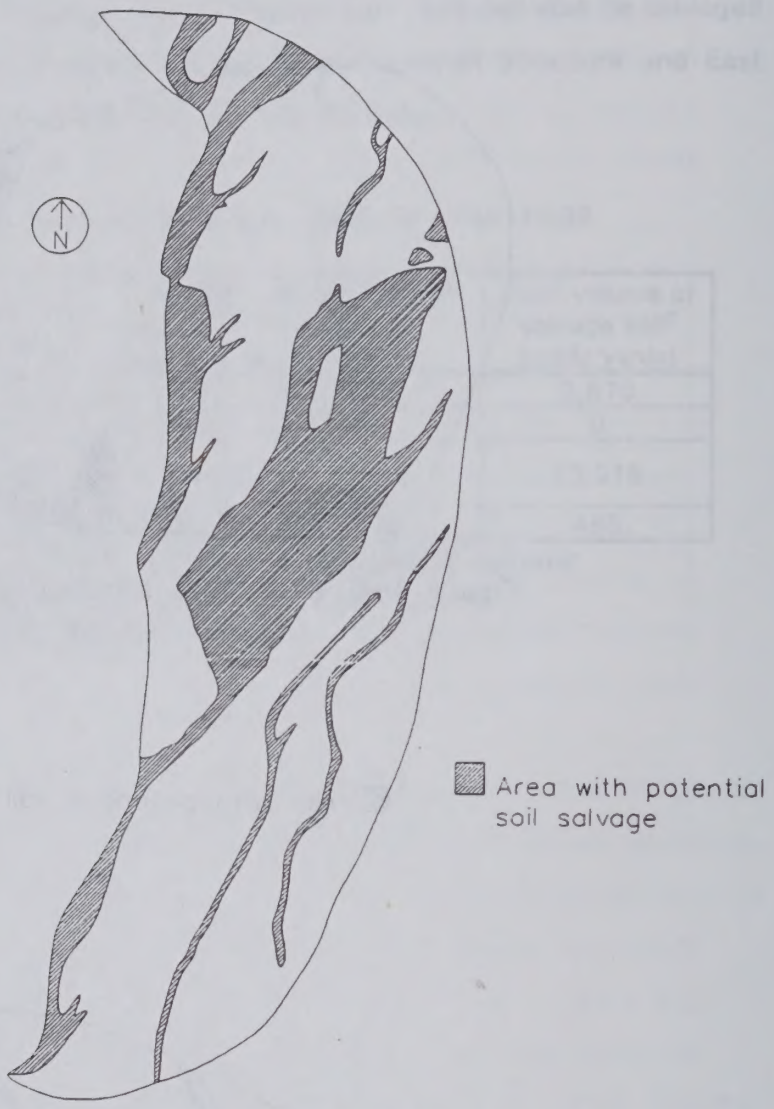


Figure 4–7 Soil salvage potential for the East Rainbow South OISA. Mesquite Mine, October 1999

5.0 SUMMARY AND DISCUSSION

The biological resources within the Mesquite Mine Project are typical for the lower, hot climate of this Sonora Desert region in southeastern California. The vegetation of the proposed Extension Areas is a typical desert creosote bush shrub/scrub. We identified two general vegetation types: a shrub/scrub vegetation dominated by widely spaced shrub plants on alluvial flats and slopes; and tree/shrub vegetation with small trees and a greater diversity of shrubs associated with the washes and drainages. The shrub/scrub vegetation type covered over nine-tenths of the study areas within the project boundaries and we further divided this type into four subtypes. We divided the tree/shrub vegetation into three subtypes based on wash size. Topographic and soil differences occur over the study area and this was reflected in the varied heterogeneous vegetation types and patterns on the project site.

The dominant shrubs in order of abundance are *Encelia farinosa* (inciensio), *Ambrosia dumosa* (burrobush), *Larrea tridentata* (creosote bush), and the cactus *Opuntia bigelovii* (teddy-bear cholla). The two common tree species, *Olneya tesota* (desert ironwood) and *Cercidium floridum* (palo verde), are mostly confined to wash areas at relatively low densities. Perennial shrubs are the dominant vegetation, with trees and a few herbaceous perennials present on the sides and islands of the washes.

Perennial plant densities in the vegetation subtypes ranged from 0 plants/acre on the desert pavement to 1655 plants/acre in the shallow washes. Tree/shrub vegetation type had an average density of 1055 plants/acre and covered about 10% of the extension sites. Shrub/scrub vegetation type had an average density of 164 plants/acre and covered about 75% of the extension sites. The remaining 15% was disturbed due to roads and other soil surface disruption with no or very little plant cover. Plant diversity averaged 12 species in areas with plant cover. This is a medium to low diversity indicating the low number of perennial species and wide spacing of individual plants. Cover followed a similar pattern to density with shrub/scrub vegetation type having an average of 5% cover or less, and tree/shrub with between 11 and 25% average cover in the transects measured.

Reclamation of the area can be accomplished using methods we are presently using and testing on the Mesquite Mine site. We have also tested these methods for the last 10

years at the nearby gold mining projects near Picacho Peak and in the Cargo Muchacho Mountains. These methods include recontouring for moisture enhancement, no irrigation, and revegetation using native plant species from seed. Most of the larger washes in the central portion of the project site will not be disturbed during mine development. Soil can be salvaged, where practical, from about 7% of the extension areas. Plant specimens can be salvaged, where practical, during mine construction, and include species of cactus and *Fouquieria splendens* (ocotilla). These plants can be marked prior to start of construction, and relocated to appropriate sites.

Appendix A

List of Common Plant Species at Mesquite Mine

Scientific Name	Common Name	Scientific Name	Common Name
Trees			
Cercidium floridum	palo verde	*Prosopis velutina*	mesquite
Olneya tesota	Desert ironwood		
Shrubs			
Acacia greggii	Catsclaw	*Krameria erecta*	Purple heather
Ambrosia dumosa	Burrobush	*K. grayi*	Desert ratany
Asclepias subulata	Milkweed	*Krascheninnikovia lanata*	winterfat
Bebbia juncea	Sweetbush	*Larrea tridentata*	creosote bush
Calliandra eriophylla	fairy duster	*Lycium andersonii*	box thorn
Ditaxis lanceolata	lance-leaved ditaxis	*L. cooperi*	box thorn
D. neomexicana	Ditaxis	*Nicotiana obtusifolia*	tobacco
Encelia farinosa	Inciensio	*Porophyllum gracile*	Odora
Fouquieria splendens	Ocotillo	*Psorothamnus schottii*	indigo bush
Hibiscus denudatus	rose mallow	*Simmondsia chinensis*	Jojoba
Hymenoclea salsola	Cheesebush	*Stephanomeria pauciflora*	wire lettuce
Hyptis emoryi	desert lavender		
Cactus			
Echinocactus polycephalus	cotton-top cactus	*Opuntia basilaris*	beavertail cactus
Mammilaria tetrancistra	nipple or fishhook cactus	*O. bigelovii*	teddy-bear cholla
Opuntia acanthocarpa	Buckhorn cholla	*O. ramosissima*	pencil cactus
O. echinocarpa	golden cholla		
Grasses			
Achnatherum speciosum	desert needlegrass	*Erioneuron pulchellum*	fluff grass
Aristida purpurea	triple-awned grass	*Pleuraphis rigida*	big galleta grass
Bromus madritensis	red brome	*Schismus barbatus*	mediterranean grass
B. tectorum	downy chess		
Herbs			
Amsinckia tessellata	Fiddleneck	*Gilia spp.*	Gilia
Atrichoseris platyphylla	gravel-ghost	*Gilia latifolia*	Gilia
Brassica tournefortii	Mustard	*Hesperocallis undulata*	Desert lily
Calycoseris wrightii	yellow tack-stem	*Horsfordia newberryi*	Yellow felt-plant
Camissonia boothii	booth's evening primrose	*Langloisia setosissima*	langloisia
C. brevipes	Evening primrose	*Lepidium lasiocarpum*	peppergrass
C. claviformis	club evening primrose	*Loeseliastrum schottii*	Calico
C. refracta	narrow-leaved primrose	*Lotus sirigosus*	Lotus
Chaenactis carphoclinia	pebble pincushion	*Mentzelia albicaulis*	small-flowered blazing star

Scientific Name	Common Name	Scientific Name	Common Name
C. stevioides	Chaenactis	*M. involucrata*	sand blazing star
Chamaesyce albomarginata	white-fringed sandmat	*Mohavea confertifolia*	ghost flower
C. polycarpa	prostrate spurge	*Mirabilis bigelovii*	four o'clock
Chorizanthe brevicornu	brittle spine-flower	*Monoptilon bellioides*	Desert star
C. corrugata	Corrugata	*Nama demissum*	Purple mat
C. rigida	spiny chorizanthe	*Nemacladus glanduliferus*	Thread plant
Cryptantha angustifolia	narrow-leaved forget-me-not	*N. rubescens*	rigid-stemmed thread plant
C. barbigera	Bearded forget-me-not	*Oligomeris linifolia*	linear-leaved cambess
C. circumscissa	Western forget-me-not	*Pectocarya platycarpa*	broad-nutted comb-bur
C. dumetorum	Flexuous forget-me-not	*Perityle emoryi*	rock daisy
C. maritima	white-haired forget-me-not	*Phacelia crenulata*	notch-leaved phacelia
C. micrantha	Nevada forget-me-not	*P. distans*	fern phacelia
Dalea mollissima	Indigobush	*P. fremontii*	fremont phacelia
Descuriana pinnata	yellow tansy mustard	*Plantago ovata*	Plantain
Eremalche rotundifolia	desert five-spot	*Psathyrotes ramosissima*	Turtleback
Eriastrum diffusum	Eriastrum	*Salsola tragus*	russian thistle
Eriogonum inflatum	desert trumpet	*Salvia columbariae*	Chia
E. pusillum	yellow turbin	*Sarcostemma cyanchoides*	climbling milkweed
E. thomasii	thomas buckwheat	*Streptanthella longirostris*	small jewelflower
Erodium texanum	desert heron's bill	*Tiquilia canescens*	Tiquilia
Eschscholtzia minutiflora	little gold poppy	*Trichoptilium incisum*	Yellow-head
Euphorbia eriantha	beetle spurge	*Trixis californica*	Trixis
Fagonia laevis	smooth-stemmed fagonia	*Uropappus lindleyi*	silver puffs
Geraea canescens	desert sunflower		

(Nomenclature according to The Jepson Manual, 1993)

Adapted from a list of plant species for this area by Ted Rado, Consulting Biologist, Riverside.

Appendix B
Photographs



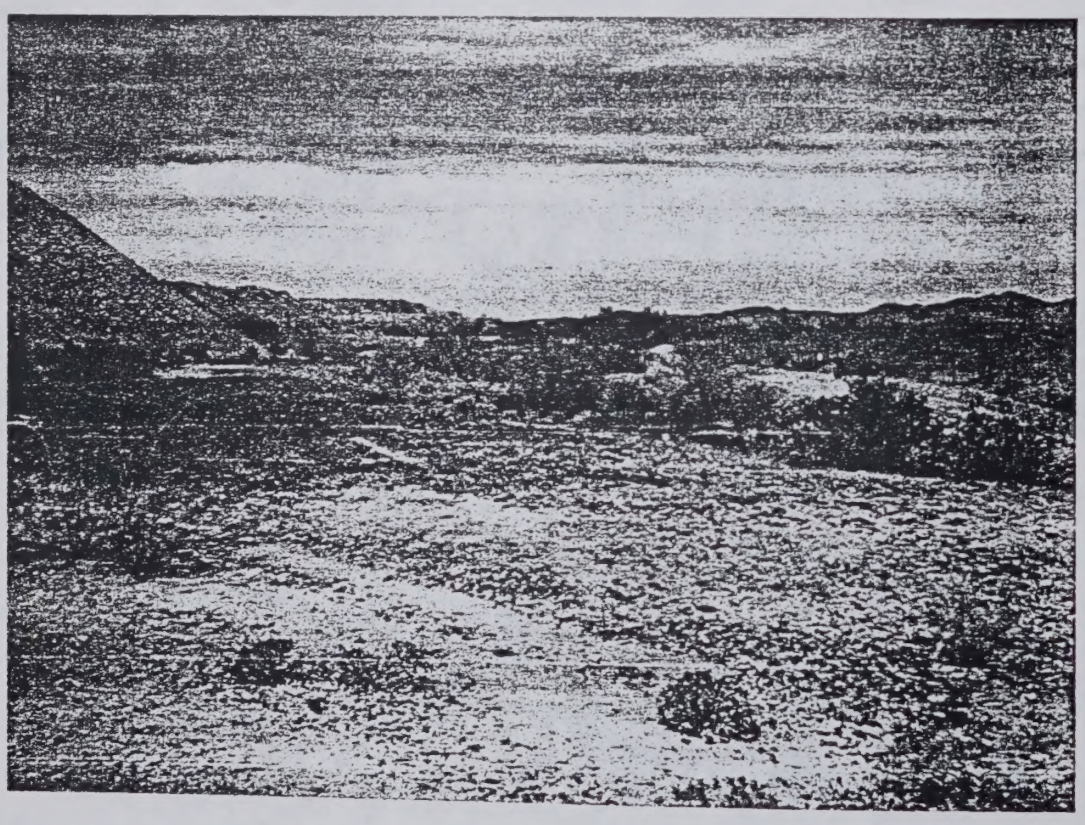
Photograph P-1 View south across the north extension of the Big Chief Pit.



Photograph P-2 View north across upland slopes of the Big Chief OISA.



Photograph P-3 View to the north of shallow washes in the East Rainbow South OISA.



Photograph P-4 View to the west of the East Rainbow North OISA.

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